

DOCUMENT RESUME

PS 001 648

ED 027 967

By-Robison, Helen F.; Mukerji, Rose

Concept and Language Development in a Kindergarten of Disadvantaged Children.

Spons Agency-Office of Education (DHEW), Washington, D.C. Cooperative Research Program.

Report No-CRP-S-320

Pub Date May 66

Note-228p.

EDRS Price MF-\$1.00 HC-\$11.50

Descriptors-*Concept Formation, *Culturally Disadvantaged, *Curriculum Guides, Educational Strategies, *Kindergarten, Language, *Language Development, Mathematics, Parent Participation, Pilot Projects, Social Studies, Teaching Methods

This document proposes a kindergarten curriculum designed to contribute to a substantial reduction of the cultural and conceptual gaps in the development of disadvantaged children. The study of an urban kindergarten class of 25 focuses on a curriculum emphasizing social studies, mathematics, and language and on teaching methodology with emphasis on parent involvement. A description of the project is followed by chapters on structural programs in social science, mathematics, and language and a chapter devoted to the teacher and teaching strategies. According to this document, a major finding of the study was that the single most productive teaching strategy for disadvantaged kindergarten children was the selection of very specific goals toward which to plan. Conclusions on curriculum success are outlined. (DO)

ED 027967

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

DEPARTMENT OF EDUCATION
OFFICE OF EDUCATION
STAFF POSITION PAPER
POSITION OF POLICY

**CONCEPT and
LANGUAGE DEVELOPMENT
in a
KINDERGARTEN
of
DISADVANTAGED CHILDREN**

Helen F. Robison

Rose Mukerji

88
44
16
00
00
S
P

COOPERATIVE RESEARCH PROJECT S-320

CONCEPT AND LANGUAGE DEVELOPMENT
in a
KINDERGARTEN OF DISADVANTAGED CHILDREN

Cooperative Research Project No. S-320

Helen F. Robison
Teachers College
Columbia University

Rose Mukerji
Brooklyn College
City University of New York

The research reported herein was supported by the
Cooperative Research Program of the Office of Edu-
cation, U. S. Department of Health, Education and
Welfare.

May 1966

PREFACE

The problem under study in this demonstration project is currently receiving a great deal of attention. There is widespread acceptance of the need to evolve new curriculum patterns and teaching strategies in the schools to reduce the deficits in conceptual and language ability of a sizeable segment of the young population in depressed areas.

The researchers chose to study innovation in curriculum development and teaching strategies in a naturalistic setting which reflects the conditions of learning and teaching in inner-city schools. It seems likely that findings which emerge from demonstration studies like this one will have relevance to teachers of young children, in addition to furnishing detail needed for experimental studies.

The researchers are indebted, for substantial cooperation and support, to many colleagues on the staff of P. S. 282 Brooklyn, of the New York City Board of Education: Miss Jenny Montag, Principal, for her sustained interest and support in facilitation of key aspects of the project; Miss Lois Jacobson, teacher of the demonstration kindergarten class, for

her deep involvement and enthusiastic participation in realizing the plans of the program; Assistant Principals, Mr. Bernard Levenson, and Miss Margaret Gilboy, and Mr. Venancio Medina, Spanish Coordinator.

The researchers are grateful to other New York City Board of Education personnel who facilitated and supported this project, including Mr. Maurice Mehlman, Assistant Superintendent, District 25-27 in Brooklyn, Miss Ann Goldstein, the Language Arts Coordinator in this School District, Mrs. Rebecca Winton, Director of the Bureau of Early Childhood Education, and especially Mr. Victor Spevack of the Bureau of Audio-Visual Instruction.

Mr. Irving Carlin, and Mrs. Ruth Rosenfeld, Principal and Teacher, respectively of P. S. 157 Brooklyn made it possible to test a comparison class of kindergarten children.

The researchers would like to express their sincere appreciation to the administrations of the Department of Education of Brooklyn College of the City University of New York and of Teachers College, Columbia University for their cooperative support of this project.

Rose Mukerji

Helen F. Robison

TABLE OF CONTENTS

	<u>PAGE</u>
CHAPTER I PURPOSE AND SCOPE OF STUDY	1
CHAPTER II EVOLUTION OF PILOT PROJECT	9
CHAPTER III DESCRIPTION OF PROJECT	19
CHAPTER IV SOCIAL SCIENCE CONCEPTS	50
CHAPTER V MATHEMATICS CONCEPTS	82
CHAPTER VI LANGUAGE DEVELOPMENT	117
CHAPTER VII THE TEACHER AND TEACHING STRATEGIES	159
CHAPTER VIII CONCLUSIONS	191

CHAPTER I

Purpose and Scope of Study

Current research increasingly emphasizes the pre-school and early school years as the critical period for language and concept development. Success in reading and in reaching satisfactory achievement in all content areas of the school program appears to be impossible without a stable grasp of needed concepts and the concomitant skills of verbalization and communication.

The Problem

Children from disadvantaged urban communities are significantly less equipped with language skills and conceptual formulations when they enter kindergarten than children from middle-class environments. While pre-kindergarten education is greatly to be desired and encouraged, especially in experimental programs, there continues to be an urgent need to determine how the critical kindergarten year in school can be designed to contribute to a substantial reduction of the cultural and conceptual gaps in the development of disadvantaged children. The school holds the most promise as the agent which can offer needed background and experiences to deprived, urban children in order to overcome learning deficits and to help them develop efficient learning strategies. The problem, primarily, concerns the development of more appropriate curriculums and the concomitant changes in teaching behavior required.

Related Literature

Piaget's theory of the child's intellectual development, through successive stages of equilibrium of adaptation, emphasizes the child's actions and manipulations as his method of accommodating the ego to the realities of the environment. His focus on the transitions between one stage of intellectual development and the next highlights the crucial role of the child's experience in forming the structure needed for

functioning at higher levels.¹ Hunt concludes from his study of Piaget that the rate of the child's intellectual development is to a considerable degree a function of the child's encounters with the environment.²

Flavell's interpretation of Piaget includes the implication for teaching that the child should first work in the most concrete and action-oriented context possible, manipulating objects himself to "see" the principle operate in his own actions. Then, says Flavell, Piaget would have the child progressively internalize and schematize the idea, reducing perceptual and motor supports and moving from objects to symbols of objects and from motor action to speech.³ White's theory of competence motivation also supports a high level of active interaction with the environment and offers the concept of "effective motivation," involving satisfaction or a feeling of efficacy in transactions in which behavior has an exploratory, varying, experimental character and produces changes in the stimulus field.⁴

Almy, replicating some Piaget tests of children's thinking, found children in day care centers in low socio-economic areas functioning at distinctly lower levels than middle-class children of the same age.⁵ Martin Deutsch, studying the effects of cultural deprivation in three and four year olds, has detailed the poverty of perception, information and

1. Jean Piaget, Logic and Psychology, New York, Basic Books, 1960; The Psychology of Intelligence, Paterson, New Jersey, Littlefield Adams, 1947; Judgment and Reasoning in the Child, New York, The Humanities Press, 1962; Play, Dreams and Imitation in Childhood, New York, W.W. Norton Co., and with Barbel Inhelder, The Growth of Logical Thinking from Childhood to Adolescence, New York, Basic Books, 1958.

2. J. McV. Hunt, Intelligence and Experience, New York, The Ronald Press Co., 1961, p. 358.

3. J.H. Flavell, The Developmental Psychology of Jean Piaget, New York, Van Nostrand, 1963.

4. Robert W. White, "Motivation Reconsidered: The Concept of Competence," Psychological Review, 66, No. 5:297-333, 1959.

5. Millie Almy and E. Chittenden, "Young Children's Thinking: Understanding of the Principle of Conservation," presented at the Biennial Meeting of the Society for Research in Child Development, Berkeley, 1963.

understandings of these children.⁶ He is testing an hypothesis that "early intervention by well-structured programs will significantly reduce the attenuating influence of the socially marginal environment."

All the foregoing point to the need of the disadvantaged five-year-olds to experience a kindergarten curriculum which will help to compensate for prior experiential deprivation and the need for guidance which will facilitate the conceptual and language growth required for academic success. Bruner has contributed the focus on key concepts of the disciplines and on learning the ways of knowing of the scholars as the vehicle for more efficient curriculum building and for maximizing the efficiency of learning strategies.⁷ He has stimulated many research projects and experimental and demonstration programs in several disciplines which are concerned with delineating key concepts, developing curricula and materials and longitudinal school programs. Very little of this research has taken place at the kindergarten level and practically none has been directed to deprived five-year-olds.⁸

Wann's recent study documented the ways in which young children collect facts and try to use them for generalization and deduction.⁹ Two recent doctoral studies of concept de-

6. Martin P. Deutsch, "The Disadvantaged Child and the Learning Process," in A. Harry Passow (Ed.) Education in Depressed Areas, N.Y., Teachers College, Columbia University, 1963, pp. 163-167.

7. Jerome S. Bruner, The Process of Education, Cambridge, Harvard University Press, 1960; On Knowing. Essays for the Left Hand, Cambridge, The Belknap Press of Harvard University Press, 1962.

8. Programs now being developed, or recently completed, include a Curriculum Study Center at the University of Minnesota in the social sciences, the Minnemast program at the same university in mathematics and science, the Senesh economics program, the Greater Cleveland program in mathematics, and others.

9. Kenneth D. Wann, Mirian Selchen Dorn and Elizabeth Ann Liddle, Fostering Intellectual Development in Young Children, Teachers College, Columbia University, 1962.

velopment with middle-class kindergarten children indicate some of the activities, experiences and strategies successfully employed and some of the concepts which can be learned by five-year-olds.¹⁰ The problem is to adapt these findings to the learning needs of children in kindergarten in deprived areas.

The theories and research cited indicate that children's curiosity and satisfaction in active play and manipulation can be encouraged in a program which stimulates and achieves needed activities in selected environmental areas and which guides the activity and play toward verbalization, communication, categorization and analysis, generalization and logical thinking through planned and structured classroom activities.

Focus of Study

The study was proposed to demonstrate a kindergarten program for disadvantaged children which would strengthen the curriculum in its emphasis upon language growth, concept development and symbolic representation. It recognized the important contributions of child development to programs for young children and elected to retain many desirable features of the existing kindergarten program. It also limited the scope of the project to that part of the curriculum designated as social studies and mathematics, primarily, within a highly integrated curriculum pattern characteristic of general kindergarten practice. Emphasis on language growth was seen as an overarching aspect of the curriculum since language was conceived as an essential means of encoding and decoding experience and communicating ideas and feelings. Therefore, all language activities were to be integrally related to the variety of experiences of kindergarten living. It would, of course, be impossible to isolate completely the social studies and mathematics aspects of the curriculum, but the study was planned to focus on these facets of children's learning.

10. Helen F. Robison, "Learning Economic Concepts in the Kindergarten," Doctor of Education Report, N.Y., Teachers College, Columbia University, 1963, typewritten, and Bernard Spodek, "Developing Social Science Concepts in the Kindergarten," Doctor of Education Report, N.Y., Teachers College, Columbia University, 1962, typewritten.

A second focus of the study was the teaching methodologies of the kindergarten teacher. The project engaged the teacher in a detailed and thoughtful consideration of the goals of the demonstration project as a basis for developing the teaching strategies needed to accomplish these goals. Because the teacher was not responsible for formulating the study, frequent and sustained interpretation of the goals of the project was required by the researchers. Continuous evaluation of procedures and methodology was also required to develop more congruence between goals and procedures. The study was concerned with demonstrating teaching methodology required by the goals and in identifying some of the problems involved in such a process of change.

Cooperative relations with parents were seen as having an important impact on efforts to strengthen the kindergarten curriculum and its educative impact on the children. Therefore, a concomitant aspect of the study was concerned with the development of relations with the parents of the children in the demonstration class, to enlist their involvement in their children's education. The common difficulties in establishing helpful working relations with parents in neighborhoods in depressed urban centers were encountered in this situation.

In summary, the two-pronged focus of the study related to the curriculum with primary emphasis on social studies, mathematics, and language, and to teaching methodology, with related emphasis on parent involvement.

Setting

The setting for the study was a single kindergarten in a public school in New York City which was designated by the New York City Board of Education as a "special service" school. The term applies to schools which are characterized by various factors indicating cultural and economic disadvantage.¹¹ The plant itself is new and modern, having been built in 1963. It was overcrowded to the extent that the lower primary grades were on double session. The kindergarten was one of three in the school. These were light, cheerful,

11. The ethnic groups represented in the school were roughly one-third Negro, one-third Puerto Rican, and one-third other, including Italian, Greek, Jewish, and Chinese.

PS001648

well-equipped classrooms with furniture and basic materials, but small in area. Although these classrooms were in the basement, they were at ground level, with direct access to the school playground.

There was a single teacher for a class of twenty-five children whose school day ran from 8:40 to 11:50 a.m. This teacher also taught an afternoon class which was not involved in the project. As a special service school, additional professional staff was available on a regular basis. Another teacher, designated as "Other Teaching Personnel" was responsible for the children for one hour on each of two days per week. During this period, the regular teacher was relieved of classroom duties, with time for planning and preparation. Only the classroom teacher was involved in the study.

Population

There were twenty-five children in the demonstration kindergarten who, at the beginning of the study, had a median age of 5 years, 1 month. There were fourteen boys and eleven girls. More than half of the children spoke Spanish. While most of these children were bi-lingual, several children had English speaking vocabularies of very few words. The comparison group, in another school, described in Chapter III, was used only for comparing standardized test results and the results of a brief vocabulary test.

Results

As a result of the demonstration project, considerable detail is now available to identify and describe the curriculum changes, teaching methodologies and some of the other vital components seen as required by more fruitful programs for disadvantaged kindergarten children. The researchers are eager to share their findings, insights and detailed program descriptions with the many teachers and researchers who are studying these challenging problems, in the hope that many such exchanges will prove productive in helping to shape appropriate curriculums for these children.

The project indicated that considerable progress in changing teaching behavior is possible, but that the process is slow and developmental and, like the young child's conceptual growth, can not be expected to put forth definitive

and final forms of end-products on demand. The need to hasten the process of changing teaching behavior must challenge more creative innovation in this area than has yet developed. Another area that has urgent need of improvement lies in the school's relationships with parents in disadvantaged communities. More and better trained personnel and different conceptions of relationships and functions are in order. If a young child is forced to attend school when he is ill because both parents work and cannot afford to lose hourly-rated pay, there must be avenues developed to deal with such common problems which do not penalize the school, the teacher, the parents, the sick child or his classmates. It is in areas such as these that friction develops between school and home. Somehow, the community must approach the problems of its children with better comprehension of their real needs and more appropriate remedies for their ills.

The curriculum developed in this project, which is described in detail in succeeding chapters, appeared to be stimulating to and productive for the teacher and the children. As with any developmental curriculum, no matter how detailed its goals, content, materials and methodologies, there was considerably less than perfect congruence between the plan and the product. Filtering a program through the perceptions and abilities of any classroom teacher results in one which differs in some important respects from the blueprint design. The program would, therefore, be different in some important respects for each teacher who might desire to implement it. The researchers are convinced that wherever there are substantial aspirations for the goals of the curriculum proposed here, a dynamic influence can be exerted toward improving the realities of programs for young children.

While test results reflected some advantage for the demonstration group over the comparison group, the greater English language problems in the former tend to vitiate the comparisons. On balance, the data give promise for productive results in conceptual growth of disadvantaged kindergarten children, despite severe language disabilities, with indications that these also were notably diminished. It is only possible to speculate how much the test results might have been influenced had there been earlier changes in teaching behavior and more consistent application of the teaching strategies proposed for the demonstration. It is possible that test results will not reflect such changes in teaching, except over long periods of time. It is possible that traditional programs and teaching behaviors in primary grades

may counterbalance kindergarten gains, so that, in the end, nothing is gained. It is also possible that productive teaching strategies in the kindergarten may help many disadvantaged children achieve permanent benefits, which subsequent teachers may be inspired to maintain and to cultivate.

CHAPTER II

Evolution of Pilot Project

In preparation for the demonstration project, a pilot study was undertaken for five months in the spring of 1964. Its aim was to facilitate the realistic selection of specific concepts and a range of experiences on which to build a kindergarten curriculum based on significant concepts of social studies and mathematics with particular emphasis on language growth. The pilot study also helped to locate the school and personnel which would support the aims of the project.

The researchers located an administrator of a "special service" school in New York City who was enthusiastic about basing the project in her school. A supportive and interested principal was considered of prime value in facilitating the introduction and development of the project. This turned out to be a correct estimate. One of the kindergarten teachers in the school was selected and agreed to serve as the teacher in the project. It was intended that the same school and personnel would be involved in both the pilot study and the demonstration project which was to follow in the academic year of 1964-65.

Personnel

The kindergarten teacher was licensed in early childhood education by the State of New York and was on tenure as a regularly appointed teacher in the New York City public school system. She had five years of kindergarten teaching experience. The principal, who met with the researchers and the teacher on a regular basis, participated in planning sessions, particularly as they related to facilities, scheduling and personnel, and generally supported the purpose and growth of the project. The assistant principal participated in some conference sessions and extended help, particularly for audio-visual requirements of the project. The Spanish coordinator assisted in translating at meetings of the kindergarten parents, and for newsletters. The reading coordinator of the district represented the assistant superintendent as an observer and participated in a few planning sessions.

The Bureau of Audio-Visual Instruction of the New York City Board of Education cooperated very effectively in providing photographic and audio equipment, with active participation by one staff member in photographing the children both on trips and in the classroom, and advising on audio-visual problems.

Subjects

The single kindergarten class of the pilot study was composed of twenty-five children. The ethnic groups represented were Negro, Puerto Rican, Jewish, Greek, Italian and Chinese. Despite a very high turnover rate of children in the school, recently estimated by the principal to be 97%, there was very little change in the kindergarten group. Only two children left and were replaced during the term.

Pilot Study

The pilot study made it possible to develop procedures that could be tried out and evaluated, as well as materials that could be refined for more efficient use in the demonstration project. The researchers, who selected the objectives and the hypotheses of the study, found them relevant for retention in the subsequent demonstration phase of the study. Briefly, it was hypothesized that kindergarten children can be helped to develop efficient learning strategies utilizing the beginnings of key concepts in social studies and mathematics, and various forms of verbal symbolization and symbolic representation through selectively structured experiences and play activities.

Key Concepts

Concepts were selected to give direction to the content of the curriculum to be developed as follows:

A. From social sciences:

1. Interdependence as a characteristic of our society
2. Specialization as a characteristic of our society
3. Cultural pluralism as a value in our democratic society
4. Map concepts

B. From mathematics:

1. One-to-one correspondence
2. Cardinal numbers and rational counting
3. Numerals
4. Denominations of money

C. From language:

1. Names, labels, vocabulary
2. Fluency of communication
3. Language structure, sentence form
4. Esthetic quality, expressiveness, colorfulness, affective qualities of oral language

D. From symbolic representation:

1. Map concepts
2. Signs, labels

Topic or area of study

It was recognized that the selected concepts could not be taught directly as abstractions to kindergarten children. It was therefore necessary to develop the beginnings of these concepts through specific topics or areas of study that would have interest and meaning to young children. A sampling of appropriate topics or areas of study might have included providing for families' food needs, transportation, communication, and community services. The first of these, "providing for families' food needs" was selected for the exploratory phase of the study.

Sub-concepts

On the basis of the selected topic or area of study, sub-concepts were formulated in such a way as to facilitate specific planning with the teacher. A few examples of sub-concepts which related the topic of "food" to the three selected social science key concepts will illustrate this procedure.

Interdependence

1. New York City families buy food from different kinds of food stores.
2. Some stores sell only one kind of food, such as meat or fruits and vegetables.

3. Many big supermarkets sell almost every kind of food.

Specialization

1. In big supermarkets, different jobs are done by different people.
2. In big supermarkets, there are usually a manager, stock clerks, butchers, checkers, and often delivery boys.

Cultural pluralism

1. In New York City there are so many families whose ancestors come from different countries that there are many stores which carry the kinds of foods which they like and are used to eating.

Map concepts

1. Areas in the city can be located by distance and direction.
2. A picture can be made of different parts of the city, or of the world. Such a picture is called a map and uses scale, distance and direction.

Guidelines

In keeping with major developmental principles about children's learning and conceptual growth, the study featured play and exploration by individual children as a major learning method. It provided intellectual stimulation through an expanded environment, trips, manipulative materials, audio-visual materials, and a setting rich in verbal stimulation and symbolization.

Some preliminary goals were set in helping kindergarten children to develop concepts. These goals dealt with helping children to gather information, to use the information they gather, to begin to develop skills of logical thinking, to improve communication skills, and to improve auditory and visual perceptual skills.

There was some exploration of ways to reach the parents of the children in the class, to enlist their help in the education of their children. The help of the Spanish Coordinator was sought, particularly in making contact with Spanish-

speaking parents in the group. Specific suggestions were prepared for the teacher to be used during individual and group conferences with parents, relating to "Things to do with your child," such as "Talk to him about what he is doing at school to help him improve his speech," and "When your child brings a book home from school, read it to him or talk about the pictures with him." It was also suggested that parents, "Help him to learn the names of money coins, such as penny, nickel, dime." The Spanish Coordinator was to be available to translate as needed during parent meetings and conferences. In order to maintain contact with those parents who were unable to participate in school-time events, plans were made to reach them by a kindergarten newsletter on a regular basis. The principal was particularly interested in this facet of the program since it coincided with her sustained efforts to build strong community relations with her school and to serve the parents as well as the children in the school.

Tests

The researchers required evaluative instruments that would be specific to the aims of the project. They devised a test of vocabulary related to understandings about "food," the topic to be pursued, using color prints and models of fruit and vegetables. A test of money identification and equivalence and of the concept of change-making was also devised. All tests were administered individually. The chief purpose of these tests was to discover the problems involved in formulating and utilizing specially constructed tests for children who are deficient in the English language and who, in many cases, speak English as a second language. Tests of verbal skills were also developed in the form of transcribed tape-recorded interviews with one or two children.

Procedures

The researchers formulated the pilot study, determined the key concepts to be used, and gathered and interpreted the observational and test data. During regular weekly consultations, the teacher, with the researchers, planned for the on-going curriculum. The teacher initiated and carried out the plans. At times, the researchers acted as assistants to the teacher and as resource personnel. The part of the program under study was conceived as a related part of the total curriculum of the kindergarten.

Analysis of Pilot Study

The findings of the five-month pilot study tended to confirm the nature of conceptual and language deficits which had been anticipated in the statement of the problem which preceded the study. It confirmed and illustrated deficiencies in knowledge and understanding of class concepts, in categorizing and classifying objects into defined classes. There was ample evidence of a paucity of vocabulary, lack of fluency and lack of forms of standard English usage.

Strengths

It was evident, from the pilot study, that the basic approach of basing a curriculum for disadvantaged kindergarten children on key concepts was a promising one for both the improved education of the children and the potential for changing teaching practices to meet the special needs of these children. The key concepts served as a reliable foundation on which to determine learning goals that were important for current, as well as future, understandings in the educational experience. The development of specific sub-concepts on the basis of a selected topic or area of study was particularly useful in giving direction to more specific curriculum planning by the teacher. It enabled her to determine the materials, equipment and activities which would be useful in helping the children grow toward the desired learning goals. The clearly-stated sub-concepts also provided a base against which to analyze the data which were gathered through observational records and tape-recordings. These data, shared in regular conferences by the researchers and the teacher, were useful in giving direction to the developing teaching-learning process.

In the established procedures which the teacher initiated to carry out the program with the children, she felt sufficient freedom to use her own ingenuity in her teaching role. She was particularly inventive in devising play materials for the children and in capitalizing spontaneously on educative opportunities as they arose. The sustained interest and encouragement of the principal and the assistant principal were of great value in providing professional support to the teacher.

As for the children, it was found that a close inter-relationship of work on concepts, language, and structured

experience with expanded opportunities for manipulative and play experience was a promising pattern of programming. The children's need for spontaneous play and free exploration of new materials was revealed over and over again whenever new materials were introduced. It was only after this self-determined manipulation of materials was satisfied, that these could be structured for further learning of a more complex nature. The children responded with enthusiasm to the new activities which were tried out and these appeared to have the desired stimulating quality.

Problems

Several problems related to the development and use of specially devised tests were apparent. It was found to be very time-consuming to gather and prepare materials for the tests. Since, in the case of the vocabulary test, the selected words needed to be based on the topic or area of study, it was necessary to explore the topic with the children sufficiently to determine whether it might be a base through which to approach the beginnings of key concepts. By the time such interest is manifest in the class, it may be too late to gather and produce the appropriate photographs and models for testing purposes. While a more general vocabulary list could obviate these considerations, it would fail to provide feedback on children's vocabulary comprehension growth attributable to school learning.

There were problems in gathering data during the on-going program of the kindergarten class. The observational records provided the richest source of data but, in a free-flowing play period, with many groups, shifting personnel, and numerous activities in which to record simultaneously, the difficulties are obvious. Since the researchers were available on the average of three days a week, it was not possible to secure the complete picture which might have evolved through daily observation.

Although the teacher was encouraged to keep observational records, she found this unaccustomed way of working difficult. For the most part, her notes served to recall some event which she reported verbally to the researchers. Before the pilot study, the teacher followed a more conventional kindergarten curriculum which provided that a new "center of interest" be developed every week or every alternate week. The pilot study offered a new experience to engage in sustained planning

around a single topic, elaborating it in line with identified needs as revealed by an analysis of recorded observation. When the records showed that children continued in their misconceptions and ignorance of material that had been "covered" in group discussion, the teacher was somewhat disturbed. It made her question her established way of teaching, of moving quickly from topic to topic under the assumption that children were learning at the rate at which topics changed. The teacher began to question the children's ability to learn. Although this self-questioning was, in reality, a great strength of the pilot study, it also created problems of uncertainty in the teacher.

The least developed part of the pilot study was the anticipated work with parents. Aside from one special meeting with the parents, there were few opportunities to establish closer relations with them. Some materials were prepared for them and sent home, describing some of the interesting phases of the kindergarten program. Their help was elicited in stocking the kindergarten store with empty cans and boxes and in providing money and shopping requests for real shopping trips. But the study raised many questions about establishing cooperative relations with parents. These questions were seen as guides for this aspect of the children's education in the demonstration project. The following questions were raised:

1. How can the parents' cooperation and interest in their children's education be fostered?
2. How can parents be helped to develop some specific techniques to help children, as (a) reading to children? How can books be made available? Could the PTA take leadership in finding some good solutions to this problem? How can the public library help? (b) talking to children. (c) providing experiences for children through trips and community provided experiences and activities. What kind of after-school, week-end or summer experiences are available to children in this community? What social agencies, church or municipal agencies are there which might take the initiative to develop more activities and experiences for children in the community?

3. How can the school's desire and ability to help families in their encouragement of children's educational pursuits be conveyed to parents? How can the school reach more parents for individual and group conferences? How can the school enlist active parents to help reach and communicate with other parents who are unable or unwilling to attend school meetings and conferences?
4. What kinds of educational experiences can the school offer directly to parents which would increase their ability to encourage their children's interests in academic work?

Implications for Curriculum Change and Teacher Growth

The experience gained from the pilot study pointed to some implications for developing compensatory curriculums for disadvantaged kindergarten children. It appeared that promising content for such a curriculum can be based on key concepts within the various disciplines, when they are translated to a level which can be understood by the children and which can be of interest and of significance to them.

When the teacher utilized clues from the children's responses and play as the basis for guiding them toward clearly selected and understood goals, the children showed evidence of increasing their knowledge in line with these goals. The general design of studying a topic over a long period of time, in contrast to the more usual weekly or bi-weekly units, provided changing patterns of children's independent play with the teacher's structuring of activities to meet observed needs. Alternating structured with less structured activities gave the children freedom to practice and incorporate into their play those more complex ideas and more advanced skills which had meaning for them. This suggested that the nature and timing of the teacher's intervention can help children advance in language and conceptual growth. It also implied that long periods of time, measured perhaps, in months, semesters, or even longer, are needed to allow for really meaningful learning to take place, provided specific planning serves to advance individual children within the group toward important learning goals.

Contrary to a view often expressed about disadvantaged young children, the children in the pilot study demonstrated a remarkable capacity for listening attentively and carrying on group discussions for relatively long periods of time. When the content was stimulating and significant to them, they were able to sustain their interest for periods of thirty to forty minutes. This evidence appeared to place the burden of attentiveness or non-attentiveness on the content of the program rather than on the inherent nature of disadvantaged children.

Perhaps one of the most challenging implications was the idea that teachers can play a more active and effective part in stimulating new activities, providing broadening experiences, acting as models, and building bridges between children's purposes and intellectual goals of the school within a context that supports the values and goals of healthy personality and child development.

Development of Demonstration Project

As a result of the experience in the pilot project, a vocabulary definition test was developed which could be quickly determined as soon as the teacher had selected a new topic for focus during the year of the demonstration study. The teacher was asked to choose between repeating the focus of the pilot study or selecting one of several new topics. She chose to develop one of the new topics, Air Transport. The word test dispensed with objects and used a narrative form to give context to the words to be defined. Other contributions of the pilot study included some well-established relationships between the researchers and school personnel, which facilitated program development and more specific development of ideas about teaching and learning strategies.

It had been well established in the pilot study that these children were highly verbal although their ability to use school-type standard English was largely undeveloped. An important discovery about these children was their long listening span whenever their interest was captured and the ease with which this could be accomplished. Parental concerns for good education for these children had also been evidenced, even though effective ways to harness these concerns had not been developed. Based on the experience of the pilot project, the researchers prepared to program the demonstration project.

CHAPTER III

Description of Project

The study was planned to demonstrate specific teaching strategies which were expected to improve the learning strategies and the academic potential of a group of disadvantaged kindergarten children. The proposed teaching strategies differed in some major respects from those previously used in this class or in most kindergartens. The purpose of this chapter is to analyze and describe the project. A sequential description of teaching and classroom activities appears in Chapter VII.

Goals

Kindergarten goals have traditionally been stated in rather global terms and in terms of activities rather than content.¹ In this study, goals were selected both in terms of conceptual learnings derived from content areas and in terms of children's skills in language, thinking and symbolic representation. Selection of concepts from content areas as learning goals focuses on the kindergarten as the appropriate grade to initiate the young child into life-long study and reflection of man's significant knowledge and problems. This view of the kindergarten's role in school has important implications for children's learning. For example, the kindergarten teacher can view herself, and other school personnel

1. See Helen F. Robison and Bernard Spodek, New Directions in the Kindergarten, New York City, Teachers College Press, Teachers College, Columbia University, 1965, Chapter I, pp. 3-7.

can view her, as a vitally important teacher in a role crucial to the young child's beginning school learning. If the potential for learning in the kindergarten is also understood by parents, the result could be better attendance records, and a substantial increase in the parents' valuing and support of this school learning. The young child quickly senses what his parents and teachers value and he learns these values himself.

The selection of concepts from content areas tends to dispel a general attitude of "they only play in kindergarten," by encouraging play to polarize around specified fruitful learning situations. This approach leads to an increase of children's play activity over that generally found in a traditional kindergarten. A qualitative difference in the children's activity stems from the direction and purpose of the teacher's planning toward their conceptual learning. This approach also furnishes a dynamic link to the primary grades and a rational base for articulation. Of course, it is assumed that conceptual learning from content areas will eventually become goals for the primary grades, so that each grade level builds upon, elaborates and expands meanings children begin to shape in kindergarten.

It is not claimed that the selection of concepts for this study is the best, or only, method of concept selection and definition. The researchers are convinced that increasing assistance will be available to teachers in the near future as teams of educators and scholars turn to "structuring" and defining content fields and, even more important, develop useful ways to integrate learnings which eventually derive from separate disciplines. Nevertheless, tentative decisions can be made, with fruitful results, while the process of content identification goes on.

The listing of skills to be developed constituted a statement of specific goals for teacher planning and classroom implementation. The following skill list, derived from the observed needs of the young children in this school, led to construction of specific teaching strategies:

Language skills

1. Forms of communication to foster conceptualization through language.
2. Relevant vocabulary growth and use.

3. Use of language to:
 - a. Associate ideas
 - b. Apply information and ideas
 - c. Test hunches and ideas
 - d. Recall and relate information and ideas
 - e. Classify and categorize
 - f. Generalize
 - g. Discover cause-and-effect relationships
 - h. Develop creative language expression
4. More advanced forms of sentence structure and more standard grammatical usage.

Skills of symbolic representation

1. Words
2. Numerals and mathematical symbols
3. Map symbols
4. Pictures
5. Arbitrary symbols
6. Signs and labels

The researchers worked with the teacher throughout the study to plan and initiate realistic types of learning situations to achieve these skill goals. Contrary to the well-entrenched belief that five-year-olds' interests are superficial and changeable, there was no problem in the study in the systematic development of ideas over a long period of time. However, it must be added, that this result is surely dependent upon sensitive teaching, ability to deal with rising and falling interest levels, individual differences and lack of closure over long periods of learning.

Content of Study

Since this study departed from the conventional kindergarten curriculum design and since changes in curriculum seem unavoidable for disadvantaged children if not for all contemporary five-year-olds, it may be helpful to identify the major characteristics of the content curriculum developed in this study.

It may be in order to preface this description with the statement that there is no challenge here to the important place of child development in the teaching of young children in groups in school. In fact, the entire content structure proposed here can only be understood in a developmental

continuum which leads the teacher from a detailed assessment of the young child's prior experiences, his current conceptual and skill level, and his developmental and environmental needs to planning and implementing a program for gradual progress toward the school's goals. In no sense is the teacher asked to impose upon the child alien and irrelevant learnings and experiences. The teacher's view, then, is one of building a bridge from the child's current status to the level which is realistically indicated through a specifically-planned school program.

This curriculum starts with a selection of goals for the entire kindergarten year, chosen from among the major concepts of the major disciplines. In this study, the researchers, themselves, developed the detailed sub-concepts which were to guide planning of curriculum. Once the goals were selected, the sub-concepts specified and a focus selected by the teacher, both long and short range plans were made for the purpose of beginning to construct some initial understandings which would contribute to gradual shaping of key concepts in the major disciplines. The aspects of the children's environment selected for study included the neighborhood around the school, especially local food stores, and a more remote aspect, air transport centering on New York's Kennedy Airport. The content included much factual information concerning these areas, in addition to relationships, classification and conceptual development of some beginnings of basic social science ideas, including interdependence, specialization and cultural pluralism. The mathematics content was frequently related to the social science content but was not confined to this material. The mathematics learning goals were often pursued independently with commercial games or teacher-made materials or in classroom routines.

Language and symbolic skills were generally pursued within the context of the social science studies but were not confined to this material either. Practice activities in verbal and symbolic skills were often programmed independently of the social science material, especially in work on syntactic form in conversation and introducing children to additional symbol systems.

Conceptual learning was largely, but not entirely, confined to the social science material under study. It provided

the content base for stabilizing information recall, for encouraging children to make inferences, to construct class concepts, to test classification, to discover relationships and to categorize objects, jobs and personnel. The kindergarten's traditional openness to new interests and ideas, whether introduced by the teacher or the children, was preserved and enhanced, despite the new structure of content which became a strong support rather than a constricting device.

Evaluation procedures were defined early so that the teacher might be able to gauge children's progress and to adapt and to re-adapt the program according to observed needs of the children.

Organization

Equipment and Materials

The demonstration class was housed in a modern school, only four years old, in a very well equipped kindergarten, with its own bathroom and door to an outside, enclosed play yard. However this room was overcrowded with a full complement of 25 children plus furniture and equipment. Closet space for materials was quite limited for storage of numerous items, some of which were bulky. The room was inadequate to meet the needs of young children for extensive space and for room arrangements which permit relative privacy and quiet for many projects.

Crowding and space problems often hindered continuity of projects from day to day. It was, for example, difficult to maintain a "store" area over long periods with two different classes sharing the same room daily and often pursuing totally different projects. Block constructions could rarely be maintained overnight for lack of space and children frequently had to backtrack and begin over again, instead of being able to carry forward well-established ideas to explore new problems.

Within the limitations of this overcrowded room, the teacher evidenced considerable imagination in use of space, materials and equipment. Sometimes the block corner was

permitted to double its floor space, when needed for expanded construction and dramatic play about air transport. Sometimes table work was featured as children were encouraged to select and work at some of the many practice activities available.

Due to the excellent cooperation of the Bureau of Audio-Visual Instruction of the New York City Board of Education, an assortment of audio-visual equipment of good quality was available to the class. This equipment included a tape recorder, a slide projector, an 8-millimeter movie projector, a still camera, a movie camera and a teletrainer kit.

In addition to such traditional kindergarten classroom equipment as blocks, dolls, dishes and books, many other types of material and equipment were used. There were costumes and uniforms for the children to wear; props such as a surplus airplane instrument panel, small suitcases, play money, and small airplane models as well as teacher-made props such as a plane's "steering wheel," and a "gas fuel tank" with tubing. Special materials were available for work on language skills such as hardboard letters, letter stamps and ink pads; for work on mathematics skills, such as games with wooden blocks and beads, flannel-backed numerals and sets of colored geometric shapes; and, for work on classification skills, such items as empty food cans and cartons, picture cards and small, colored wooden objects.

Materials might be classified into traditional kindergarten materials and equipment, special-purpose teacher-made objects, special-purpose commercially prepared games and materials and audio-visual equipment. It should be noted that all of the content of the audio-visual material stemmed from the children, their classroom activities and their field trips.

Scheduling

In this school, kindergarten children are permitted to enter the building about 8:30 a.m. and to line up outside their classrooms, under the supervision of sixth-grade girls assigned to such duty. At about 8:45 a.m., the children enter the room, hang up their clothing in their own cubbies in a recessed area of the room and take a seat at one of the small tables. After opening exercises, the teacher usually

calls the children to sit on the floor in a semi-circle around her chair near the piano and she opens the session with a total class discussion, sometimes followed by reading a book to the class before releasing them for self-selected play or work. In many kindergarten classes, the children spend less than forty-five minutes in self-selected play and the remainder of the session in total group activities, which include discussions, books, rituals, teacher-lectures on various topics, snack and rest periods.

The new curriculum approach required considerably more individual and small group work than can be usually found in conventional programs. In general, it may be stated that the researchers and the teacher found it necessary and productive to decrease substantially the proportion of the total daily session spent in routines, rituals and total group situations and to increase the length of the daily "play" or "work" period by fifty to one hundred percent to permit the teacher to work with more children on an individual or small group basis.

The chief purpose of changing the schedule was to create more opportunities for the teacher to work individually with children and in small groups. A second purpose was to maximize the informal sector of the program, to increase children's opportunities for verbalization, and for pursuit of self-selected learning activities. A third purpose was to mold all sectors of the program to accomplish more specific purposes.

Kindergarten teachers need flexibility in scheduling to a much greater degree than other teachers because of the five-year-old's immaturity and inexperience. Variations in scheduling must also be related to the range of program needs for any class of young children.

Schedules tested in the study included several models: a program with a very long work period for self-selected activities with the teacher working during this time with successive small groups and individual children, another program in which a teacher-structured task or program predominated and preempted most of the session, and several other programs with varying quantities of time scheduled for self-selection vs. teacher structure, as indicated in the following variations.

Short Work-Play Periods. During the opening weeks of the school year, when children had yet to learn the classroom rules and the expected behaviors and when they needed the security in a predicted sequence of classroom activities, the following model of scheduling was frequently used. All times are, naturally, approximate.

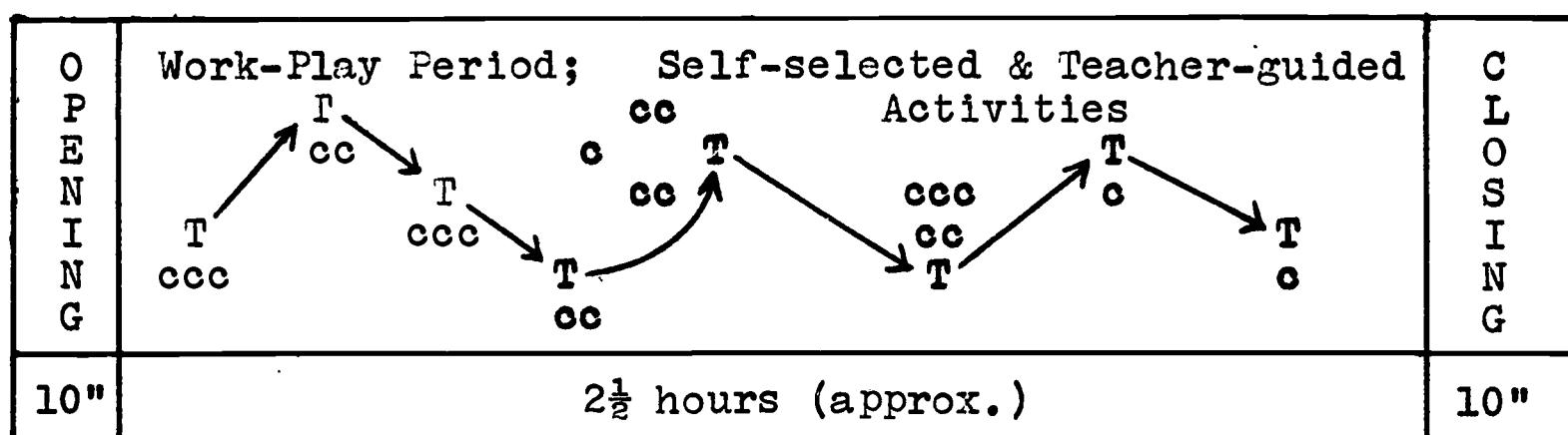
Figure 1

O P E N I N G	Outdoor Play (total group)	Snack; Quiet Time Rou- tines	Creative Drama (total) Role Play (few) Discus- sion (total)	Self- selected Activities (total group)	Story Songs (total)	D I S M I S S A L
10' 2	45'	15'	30'	45'	15'	15'

Long Work-Play Period. In this model, the brief opening exercise was usually concerned with planning particular activities, the use of special equipment, or similar matters. It was followed by a very long work-play period with optional rest and snack time at the discretion of the individual child or the teacher's suggestion when needed. Frequently, some type of musical activity for the total group closed the session before dismissal. This model may be represented in the following figure.

2. Approximate time periods.

Figure 2



T = teacher

C = child

The arrows and groupings in Figure 2 are intended to suggest the teacher's pattern of teaching as she works with small groups of children, with individual children, and with somewhat larger groups, dividing her time within the extended work-play period. She moves about purposefully, either taking advantage of a situation the children have developed or selecting the children, the content and the materials she proposes to work with according to previous plans. Instead of cutting short productive work activities for the whole class to encompass snack time or other incidental routines, the teacher announces quietly to children here and there that the snack is ready and those children who are ready for it may help themselves. She also suggests rest time as an option or as a strong recommendation to a child she thinks is tired.

Structured Experience. Two variations of this model are presented in Figures 3 and 4. The structured activity may utilize only part of the three hour session for a small group of children, as in Figure 3, or it may encompass almost the total session for the whole class as in Figure 4.

Figure 3

Opening Plan- ning (total group)	Structured experiences: cccc + (walk, shop- ping trip, cooking) O.T.P.* or ST. T.	Snack, Quiet Time (total group)	Report on and Discussion of Structured Exp. Songs & Dance	D I S M I S S A L
	Self-selected activi- ties by rest of class. Teacher circulates, working with groups and individuals as desirable. (rest of group and teacher)			
20"	90"	15"	30"	10"

*O.T.P. = other teaching personnel ST. T. = student teacher
C = child

Figure 4

Opening Reminders concerning experience (total group)	Structured Experience (bus trip to airport, museum, zoo, farm, botanical garden, etc.) (total group)		D I S M I S S A L
20"	150"		10"

There are obviously many variations for each of these models, but these will serve to describe the major schedules which were used in the demonstration class. Figure 1 is a somewhat conventional schedule and may be found in public

school kindergartens to some extent. Figure 2 is innovative for public schools, but it is the one which provides extensive opportunities for structuring and guiding individual and small group learning situations tailored to specific needs. It also allows for development of extended play ideas and independent judgment by children. The researchers' experience suggests that Figures 3 and 4 occur infrequently, if at all, in conventional kindergarten programs. Now that many schools, particularly those for disadvantaged children, have additional professional and quasi-professional personnel, it would be quite feasible to extend the use of schedules such as those indicated in Figures 3 and 4.

Teaching Strategies

Kindergarten teachers would be amused if they were told the lecture method is an inappropriate teaching strategy for five-year-olds. Oddly enough, a great deal of unrecognized lecturing goes on. The teacher's behavior is indistinguishable from a lecture when she addresses the whole class for ten or fifteen minutes on why we celebrate George Washington's birthday. The teaching strategies emphasized in this study include helping children to define problems or elements which could be studied, to seek information, to solve problems through a sequence involving play-discussion-direct-experience-discussion-play. They include initiating and directing practice activities. Other teaching strategies were geared to helping children to verbalize and express their new experiences and their developing learnings and to practice how to represent real things and ideas through symbols.

Taba defines teaching strategies as "consciously-formulated plans for bringing about particular behavioral changes in students."³ She points out that some aspects of strategy are pre-determined, while others evolve in response to diagnosed learning problems. A major element of the teaching strategies in this demonstration program was the listing of specific learning goals and the detailed planning to bring these about.

3. Hilda Taba, Thinking in Elementary School Children. San Francisco State College, p. 47.

Defining Problems with Children

One effective way for the teacher and young children to take hold of enormous bodies of knowledge is to start with a problem worth solving. In the pilot study focusing on family food needs, such problems were identified in the course of children's grocery store play in class as, "Is there a price on every food?" and "How does the customer know where to look for foods in the supermarket?"

In the demonstration study, problems were defined in many different situations. Some examples follow:

1. When a group of children were frying plantain chips in the classroom, very practical problems were stated as follows: "How many pieces will each person get?" and "Can everybody have more than one piece?", which produced the need to count the children, count the pieces of plantain frying in the pan and to compare the sums.
2. On the children's first trip to Kennedy Airport, the main question defined for study was, "What kinds of jobs do people do at airports and on planes?" This led the children to observe uniformed personnel at the airport and to try to differentiate one job from another.
3. A problem posed for "ticket clerks" was, "What can we write on tickets so people won't get on the wrong airplane and go somewhere they don't want to go?" This led to writing names, numbers, and various symbols the children added to indicate additional information needed.
4. Preparing children for a second trip to Kennedy Airport included defining a few specific questions and problems to study, such as, "How do people buy tickets?" and "What happens to the baggage?" As children incorporated newly-observed perceptions and details in their dramatic play, they began to show, in their play clearer concepts of the relationships of the different air transport occupations and their specialized functions.

Helping Children to Seek Information

The information seeking was encouraged, challenged and supported through:

1. Teacher's question.
2. Introducing new props and equipment and using these to open avenues for fact-seeking as to names and functions, specifying facts to be ascertained on walks and trips.
3. Assisting children to interview grocery clerks, porters, and ticket agents about specific aspects of their jobs.
4. Recalling and organizing facts previously collected, through slides, movies and discussion.
5. Encouraging use of new learnings in play and creative dramatizations.
6. Stressing details, comparisons, contrasts, sequence, order and relationships.

Helping Children to Solve Problems

When children voiced a need for "money" in store play and the teacher gave them some paper discs, it occurred to several children to write numerals on the discs to indicate money denominations. When airplane play began to reflect children's fact-gathering about airplane jobs, the "pilot" and "co-pilot" used earphone plugs provided by the teacher as though these were two-way radios or intercommunication systems. With the teacher's help, children solved problems of inadequate play space by rearranging the block area and of moving heavy play equipment by building a dolly.

Problem-solving was often pursued through a play-discussion-direct experience-discussion-play sequence, with many variations. Examples of this sequence can be found in Chapters IV, V and VI. It should be noted that these were not teacher-imposed problems. The structure of the learning situation was one which propelled children into involvement with the content the teacher had selected. Once involved, the children were challenged to solve problems, to advance their play in self-selected ways. A child acquires a powerful learning strategy when he feels free to pursue real problems because he sees them as his own. If the teacher helps him to feel successful in solving his self-selected problems, his motivation for further school learning would be expected to be high.

Structuring Elements in the Program

As the study developed, it became evident that many goals could not be reached without much more deliberate and selective structuring of classroom experiences. This strategy, which was regarded as relatively minor in importance at the beginning of the study, emerged as a major strategy which should have been pursued earlier. The researchers did not equate structuring with formalism and rigidity. Instead, willingness to structure elements in the program actually facilitated more differentiated teaching, more informal teacher-child contacts and more opportunities for children to play for long periods of time.

Guiding Practice Activities

One of the teaching strategies developed more fully in the demonstration program stemmed from suggestive responses in the pilot study. It concerned structuring practice activities by the teacher. Practice activities were conceived as fostering specific skills and understandings leading to the learning goals of the curriculum and as attempting to overcome some specific deficits. They were designed on the basis of identified needs of individual children; the teacher's guidance was carried on with children singly or in groups of two or three. It was anticipated that some children might eventually become motivated to pursue these practice activities in self-propelled learning.

Many examples of this strategy will be found in the chapters on mathematics concepts and language development. Work with telephones, flannel board, commercial games, tape recorder, slide viewers and movie projector offered the teacher many opportunities to initiate and direct practice activities. Role playing also was furthered by this teaching strategy.

Providing Opportunities for Children to Verbalize and Express New Ideas

Many examples of this strategy will be found in Chapter VI, Language Development. This is not a new kindergarten teaching strategy but the novelty in this study lay in the planned, systematic teaching episodes designed to achieve this purpose. Traditionally, the crucial skill of ability

to verbalize new ideas and experiences is expected to emerge as a by-product of a "rich" program. This study indicates that this strategy needs further definition and even more systematic development if children's verbal skills are to be improved to any substantial extent.

Providing Opportunities for Children to Use Symbols

Many examples of this strategy will be found in Chapters V and VI. Symbol systems employed included words, numerals, tallies, pictures, drawings, maps, clock, calendars, a graph, and arbitrarily selected symbols. The teacher provided classroom experiences for children which offered varied and frequent encounters with symbols of different kinds and encouraged this mastery of such symbols as:

1. Pictures
2. Children's names
3. Words and pictures representing job titles
4. Words and pictures representing objects used in specific jobs, such as hand truck and seat belt.
5. Numerals
6. Clock symbolism, or meaning of hour and minute hand, direction of clockwise movement, relationship of clock time to classroom and school schedules
7. Map symbolism, in its representation pictorially of geographic space and some beginnings in cardinal direction, scale and distance, and in its usefulness to air transport
8. Tallies as a counting symbol system
9. Calendars as symbols of daily, weekly, monthly time
10. Arbitrary symbols to demonstrate the inventive nature of symbolism and the deliberate decisions as to meanings to be represented, of which there are several examples in the text

Varying Time Schedules

Instead of relatively invariant time schedules which generally apply in conventional programs for five-year-olds, time schedules were changed frequently as dictated by the purposes to be served. Time structuring was viewed as more than an administrative convenience; it was viewed as a teaching strategy for total programming and for planning effective schedules for individual children. As a result, there was greater flexibility in scheduling.

Providing Materials for Learning

Instructional materials used in the study were also determined by the learning goals. This necessitated the development of new materials as well as the exploration of new uses of more conventional materials. In addition to being considered as an organization matter referred to earlier in this chapter, the selection, construction, availability and timing in the introduction of new materials was conceived as an important teaching strategy. There are many examples in the text of the growing understanding of this strategy by the teacher and how it effected some changes in her teaching behavior.

Providing Models

The models provided by the teacher and researchers were especially helpful in developing speech patterns and skills in this bi-lingual group. Other important areas in which adult models served to suggest imitation included positive attitudes toward learning and problem-solving and toward ethnic and cultural differences among children and parents.

Using Evaluative Techniques

The researchers regarded the selected evaluative techniques as necessary to the program's development. The language sample interviews pinpointed language needs, the mathematics inventory identified conceptual needs in that field, and the observational recording, by tape and by hand, furnished essential feedback on children's growth and progress.

Learning Strategies

The purpose of the teaching strategies was to help children acquire more efficient learning strategies. Improved verbal skills obviously improve the child's learning potential, his ability to understand other people and to communicate with them, and the probability of his success in learning to read and to acquire information from secondary sources. Progress in conceptual learning offers the child the same improved potential in securing meaning from his experiences and in learn-

ing to pattern his information so that he can begin to be aware of significant meanings, relationships and implications.

Other researchers have noted the direct effect of improved enunciation, pronunciation, sentence structure and grammatical forms on communication, especially for unlocking subtleties of oral statements.⁴ It was assumed that children's language patterns, where these were definitely formed, would be affected by some carryover from the school-practiced language and, for those children for whom English language patterns were minimal, that school teaching would contribute to development of more standard forms than might otherwise occur. Since it was soon established that these children were verbal, either in English or Spanish, despite primitive forms of sentence structure and enunciation, the encouragement of verbal communication in informal classroom settings, with teacher models in person or on tape, was expected to influence and improve English verbal skills of all the children.

Conceptual learning was expected to help the children symbolize meanings and objects in words, as well as other symbol systems, and to promote the children's ability to categorize and to classify, through practicing classification skills. Conceptual learning was assumed to be basic to skills of logical thinking, without which the children could not aspire to academic success later or to some beginnings of understanding about their present environment, which is of even greater importance for the growing, developing child.

Learning strategies were developed in children by giving them opportunities to decide which tasks to pursue in a highly task-oriented atmosphere with considerable freedom of choice

4. Carl Bereiter, et. al, "An Academically-Oriented Pre-School for Culturally Deprived Children," Institute for Research on Exceptional Children, University of Illinois, paper presented as part of a symposium on "Acceleration of Intellectual Development in Early Childhood," at the American Educational Research Association Convention, February 12, 1965, page 7.

in task selection. In effect, these are vital learning strategies. If the young child is surrounded by meaningful tasks, he learns what meaningful tasks are. Self-selection gives him the right to try out a task, to abandon it, to return to it, to persist in it and, eventually to master it. It also gives him the right to refuse a task, which he might find attractive some other time. If he never finds certain tasks attractive or compelling, such as learning to read, diagnosis would be in order to analyze causes and to plan for possible alternative methods.

However, the program did not rest on self-selection alone. Added to large areas of self-selection were teacher-imposed tasks, judiciously scattered through the program so that the children selected for these tasks did not usually resent or refuse them. If a child was deeply involved in a block construction with his friends, chatting and joking together with high good humor and much verbal give-and-take, the teacher would not suggest that one of these children interrupt his play to work with her on numerals at the flannel board. Instead, the teacher tried to involve a child in such a task before or after his self-selected play, or when he was attracted to the materials she was setting up, or when he asked to be allowed to play with them.

Learning that there are symbol systems and that different symbols unlock different meanings alerted children to the usefulness of acquiring symbolic learning and stimulated them to accomplish such learning. The teacher's aim was to help children develop efficient learning strategies which might include such behaviors as:

1. Accepting challenge and letting curiosity guide one to exploration and discovery.
2. Persisting in a task or a problem because of the personal dissatisfaction with uncompleted tasks or unsolved problems.
3. Seeking, accepting, understanding and using teacher direction and assistance.
4. Selecting tasks which require persistence and lead to new learning.

5. Enjoying school learning activities.
6. Willingness to initiate one's own learning, without waiting for teacher assignments.
7. Seeking and accepting status as a school learning person.

These efficient learning strategies for children were listed so that the teacher might guide children in rudimentary acquisition as powerful impulses toward academic learning. Unlike the middle-class child who tends to learn these strategies through his family and the achievement-oriented world in which he lives, the disadvantaged child must rely on the school to teach these learning strategies through a combination of complex teaching strategies.

Children's Self-Selected Activities

Late in the study, it occurred to the researchers that it would be of interest to note which learning strategies the children had come to use. During a free play period toward the end of the study, a point sampling⁵ of the children's play activities was taken four times in one morning at random intervals from seven to fourteen minutes apart. A simple code had been prepared, to differentiate among the various activities the children were free to select for their play. These were:

- N - Number concepts
- S - Word symbols
- C - Social science concepts
- W - Withdrawn (that is, passive behavior)
- A - Art
- OS - Other symbols
- P - Purely social activity
- R - Routines, such as hand washing
- M - Manipulation (of objects)

The four samplings, taken from close to the beginning to almost the end of the free play period, yielded the following distribution:

5. Point sampling refers to a random observation of children's activities, recorded by code, in which each child's activity is quickly observed and recorded in a total elapsed time of not more than four minutes.

Samp- ling Code	1st		2nd		3rd		4th	
	No.	%	No.	%	No.	%	No.	%
N	2	8	2	8	5	20	0	0
S	2	8	1	4	2	8	2	8
C	10	40	12	48	12	48	7	28
W	0	0	1	4	1	4	2	8
A	7	28	7	28	3	12	5	20
OS	0	0	0	0	1	4	6	24
P	0	0	0	0	0	0	2	8
R	2	8	0	0	0	0	1	4
M	2	8	2	8	1	4	0	0
Total	25	100	25	100	25	100	25	100

The distribution indicates some of the ebb and flow of children's interests as they became less involved in one activity and moved to another or as more children joined in a center of interest and suddenly started to work together. For example, in the fourth sampling, six children suddenly decided to find their own weather charts from the pile of individual charts and they worked to bring their own charts up to date. It is interesting to note that, except on the last sampling, as children began to indicate a need for change in activity or the end of their own interest span, the children's self-selected activities tended to concentrate on the study's content, even though the children felt quite free to pursue their own preferences. While these data are inconclusive in themselves, they are strongly supported by the observational recordings and teacher reports of children's activities. The data suggest the formation of some of the powerful learning strategies listed above, notably persistence, initiation of one's own learning, enjoying school learning and seeking status as a school-learning person.

Evaluation Techniques

In addition to two standardized tests administered at the beginning and end of the study to the demonstration as well as to a comparable group in another school, evaluation techniques included special tests, observational recordings and regular weekly or bi-weekly planning and evaluation meetings. Since the special test data will be described in succeeding chapters, only a list of such tests will be given here. These include:

1. A test of money concepts
2. An inventory of mathematics concepts
3. A test of word definitions
4. A manuscript-writing test
5. A test of verbal skills, in the form of a tape recorded interview with each child

Records of program activities were made at least twice a week, and sometimes four times a week, by the two researchers and by three research assistants. Tape recordings were usually limited to structured group discussions because it was found impossible to transcribe most of the spontaneous classroom activity with high and uncontrolled noise levels. While observations rarely covered an entire morning's program, the whole range of activities in the classroom was sampled. Particular emphasis was placed on those facets of the curriculum which were under study. However, it was considered important to sample the entire program through observational recordings because it seemed neither possible nor desirable to make sharp delineations between the planned and unplanned aspects of the program.

The observations indicated that, over the period of the study, the emphasis in the classroom kept shifting from dominance of the air transport topic to its omission in favor of other interests, to its peripheral place, with frequent renewals and extensions of interest. The researchers were in accord with the teacher that such rhythmic and episodic treatment of the focus was desirable and probably contributed to the sustained attention it received.

A considerable quantity of recorded observations dealt with the children's block building and dramatic play related to air transport. Two adjoining areas of the classroom which were also closely connected to play about air transport were the housekeeping corner and a corner which was frequently used as a ticket counter. Other observations recorded the two trips and related cooking experiences. Structured group activities constituted a large part of recorded observations.

Typed observations were regularly furnished to the teacher and were used in planning curriculum. They also furnished a rich source of data reflecting children's progress toward the learning goals of the study and detailed material from this source will be found in succeeding chapters.

The weekly, or sometimes bi-weekly, planning and evaluation meetings included the researchers and the classroom teacher. Other participants occasionally attended these meetings, such as the school principal, an assistant principal, a specialist in audio-visual education from the New York City Board of Education and a district reading consultant. At these meetings, observational recordings and test results were reviewed and analyzed and decisions and plans were made for further implementation of the program. Notes were taken of these planning - evaluation meeting discussions and plans and these served as a base from which to evaluate the program at the following meeting. The researchers used their regular classroom observations, and the recorded notes of the planning -evaluation meetings, to assess planned programs and to determine changes in pace or programming.

Test Data

The selection and development of appropriate standardized tests, to evaluate the progress of disadvantaged young children, continues to present complex and perplexing problems. In general, according to Swift, intelligence measurements of children from limited home backgrounds show lower scores than for children from advantaged homes, and generally show declining trends in I.Q. over time periods.⁶ It was this regressive trend in school aptitude which prompted this study, among others, to explore some non-traditional school programs which might contribute to more optimistic expectations for disadvantaged children in school.

Since significant standard score increases are often viewed as artifacts of testing, the two standardized tests used in this study were also administered to a comparison group. Although both classes were in comparable "special service" schools as described in Chapter 1 with comparable ethnic distribution, the comparison between the groups must

6. Joan W. Swift, "Effects of Early Group Experience: The Nursery School and Day Nursery", in Martin L. Hoffman and Lois Wladis Hoffman (editors), Review of Child Development Research, New York, Russell Sage Foundation, 1964, p. 256.

be viewed against some important disparity between them. The demonstration group was overweighted with Spanish-speaking Puerto Rican children, several of whom, even at the end of the study, were barely able to express themselves in English, while such children constituted only a small proportion of the comparison group. This discrepancy was unforeseen, because both schools actually had a school population which was approximately 45% Negro and 45% Puerto Rican. In the comparison school, apparently, the majority of the Puerto Rican children happened to be in the other kindergarten classes, which were large "double" groups (two classes and two teachers sharing a room), which the researchers had rejected as unsuitable for comparison with the single demonstration class.

The kindergarten teacher of the comparison class was a graduate of a New York City college with a Bachelor's Degree in early childhood education. She was in her fifth year of teaching as a licensed kindergarten teacher by the New York City Board of Education. Her principal considered her to be a creative teacher, highly responsive to the interests and needs of the children in her classes. She had developed good rapport with the group and they were responsive to her. Following the standard curriculum, the teacher provided many opportunities for interesting science experiences, a variety of art activities, and a wide-ranging program of music and literature. There was substantial opportunity for self-selection by the children during the play period and these periods were characterized by mobility and diversity. In conversation with the researchers, the teacher indicated that her contacts with parents were limited, for the most part, to a general meeting during Open School Week in the fall and to two scheduled individual parent-teacher conferences, one each semester.

Test Results

What is readily apparent from Table 1 is the low level of average scores for both groups, as might be expected. The very similar gains from pretests to posttests, in both groups, was unexpected. Over a 7-month period, the mean scores for both groups increased as follows:

Table I

Summary Of Standardized Test Scores: Pretests, Posttests And Percentage Gain, Demonstration And Comparison Groups, MA And IQ Scores On Peabody Picture Vocabulary Tests, Raw Score On Raven's Coloured Progressive Matrices, By Sex

Test	Demonstration Group			Comparison Group			Both Groups		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
Peabody Picture Vocabulary Test MA (years and months)	Pretest	3-4	3-4	3-3	3-6	3-11	3-1	3-5	3-7
	Posttest	4-3	4-0	4-9	4-6	5-0	3-11	4-4	4-5
	Gain	1-0	0-8	1-5	1-0	1-1	0-10	1-0	1-1
	Gain Pretest x 100	30%	21%	44%	28%	28%	26%	29%	35%
Peabody Picture Vocabulary Test IQ	Pretest	60.2	60.2	60.2	66.1	74.7	56.7	63.2	66.9
	Posttest	70.6	65.6	78.3	75.8	35.6	65.1	73.2	74.8
	Gain	10.3	5.3	18.1	9.7	* 10.9	3.4	10.0	7.9
	Gain Pretest x 100	17%	9%	30%	15%	15%	15%	16%	22%
Raven's Coloured Progressive Matrices Raw Score	Pretest	12.2	11.9	12.7	10.7	12.1	9.2	11.4	12.0
	Posttest	14.9	15.1	14.6	14.3	15.7	12.9	14.6	15.4
	Gain	2.74	3.29	1.89	3.65	3.58	3.73	3.2	3.4
	Gain Pretest x 100	22%	28%	15%	34%	30%	41%	28%	29%

* P .001

** P .01

*** P .05

	Demonstration Group	Comparison Group
PPVT-MA		
Pretest	3 yrs. 4 mos.	3 yrs. 6 mos.
Posttest	4 yrs. 3 mos.	4 yrs. 6 mos.
Raven's Raw Score		
Pretest	12.2	10.7
Posttest	14.9	14.3

It is interesting to note that, with both groups registering about a year's gain in mental age, on the Peabody Picture Vocabulary Test, over a 7-month period, both groups appear to be retarded about one and one-half years on the posttests, where mean chronological ages average 6 years, but mental ages increased to only a four and one-half year level. The calculated I.Q. score for this mental age would be about 73. Despite the low levels achieved, the rate of gain appears to be rapid. However, a cautious note is needed, since other studies have indicated training effects of pretests and posttests, even for control groups which receive no direct training.⁷

The Raven's scores are less depressing, since a raw score of 15 falls at the 50th percentile, based on norms for British children, and both groups had mean raw scores on the posttest very close to this level.⁸ If both groups were actually at average levels, as the Raven's test indicates, the low scores on the PPVT merely provide additional evidence of the inappropriateness of this test for children of low socio-economic status with severe problems of verbal comprehension and vocabulary.

7. Harry Beilin, "Learning and Operational Convergence in Logical Thought Development", Journal of Experimental Child Psychology, in press.

8. Further comparisons will be made with a new set of norms now being validated for low socio-economic American children by Zita Cantwell of Brooklyn College, CUNY.

It is by no means certain that score changes on either test represent much more than improved test know-how, in addition to effects of regression to the mean. Pretest data on Table II and posttest data on Table III indicate the great variability in both groups, reflected in wide ranges in scores and in extremely large standard deviations. For example, on the PPVT, Table II shows mental age scores ranging from 2 years 3 months to 6 years 6 months, on the pretest in the demonstration group. In the comparison group, the pretests ranged from 1 year 11 months to 5 years 7 months. On the PPVT, standard deviations approach one-third to 50% of mean scores. The ranges on the posttest, for the PPVT mental age, were even wider, as might be expected, from about 2 years 2 months to 6 years 10 months in both groups.

The significance of these wide score ranges may lie in a true reflection of wide ability differences, in indications of emotional illness, in varying ignorance of test know-how, in lack of language comprehension, or in some combination of all these factors. Preliminary analysis of data gathered from Project Head Start, according to a recent newspaper story, suggests "deep emotional trouble" for about 10% of the young children in that program.⁹

If the English-speaking children in both groups are compared, by eliminating the Spanish-speaking children, PPVT scores on mental age would be 3 years 9 months on pretest and 4 years 10 months on posttest, for the comparison group, and 3 years 11 months on pretest and 5 years on posttest, for the demonstration group. However, the latter group reduces to only 10 children when Spanish-speaking children are excluded and no reliable inferences can be drawn from so small a sample. These computations are, however, suggestive of the extent of the language comprehension problem in this group.

Another view of the language problem may be seen from Tables IV and V, which list individual children's scores. One of the 13 Spanish-speaking children in the demonstration group is listed as number 7, under girls, on Table IV. Her MA score on the PPVT pretest was 3 years 8 months but she outscored the rest of the class on the posttest, at a score

9. The New York Times, December 26, 1965, p. 27.

Table II

Detailed Statistical Summary: Means, Standard Deviations, Medians And High And Low Scores, Demonstration And Comparison Groups, By Sex, For MA And IQ Scores On Peabody Picture Vocabulary Test, And Raven's Coloured Progressive Matrices, For Pretests*

		Demonstration Group		Comparison Group		Both Groups				
		Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
Chronological Age as of 10-64 (years and months)	n=	23	14	9	23	12	11	46	26	20
		\bar{X}	5-6	5-6	5-5	5-4	5-3	5-5	5-4	5-5
		SD	0-2	0-4	0-4	0-3	0-4	0-3	0-4	0-1
		Med.	5-7	5-7	5-6	5-4	5-3	5-4	5-5	5-6
		High	5-9	5-9	5-9	5-8	5-8	5-9	5-9	5-9
		Low	4-11	4-11	5-0	4-10	4-10	5-1	4-10	5-0
Peabody Picture Vocabulary Test MA (years and months)		\bar{X}	3-4	3-4	3-3	3-6	3-11	3-1	3-5	3-7
		SD	1-8	1-2	0-10	1-2	1-0	1-1	1-1	1-1.8
		Med.	2-11	2-9	2-11	3-7	4-2	2-8	3-7	3-7
		High	6-6	6-6	4-8	5-7	5-7	5-5	6-6	5-5
		Low	2-3	2-4	2-3	1-11	2-0	1-11	1-11	2-0
Peabody Picture Vocabulary Test IQ		\bar{X}	60.2	60.2	60.2	66.1	74.7	56.7	63.2	66.3
		SD	18.8	20.8	15.2	22.2	19.6	21.0	20.6	21.5
		Med.	56.0	53.0	56.0	65.0	81.0	49.0	57.0	64.0
		High	113.0	113.0	84.0	114.0	114.0	107.0	114.0	107.0
		Low	39.0	41.0	39.0	35.0	37.0	35.0	35.0	35.0
Raven's Raw Score		\bar{X}	12.2	11.9	12.7	10.7	12.1	9.2	11.4	12.0
		SD	2.5	2.6	2.1	3.1	2.5	3.0	3.1	2.5
		Med.	12.0	12.0	13.0	11.0	13.0	10.0	11.0	12.0
		High	17.0	17.0	15.0	16.0	16.0	15.0	17.0	15.0
		Low	7.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0

*Posttests were administered 7 months after the pretests.

Table III

Detailed Statistical Summary: Means, Standard Deviations, Medians And High And Low Scores,
 Demonstration And Comparison Groups, By Sex, For MA And IQ Scores On Peabody Picture
 Vocabulary Test, And Raven's Coloured Progressive Matrices, For Posttests

	Demonstration Group			Comparison Group			Both Groups		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
N=	23	14	9	23	12	11	46	26	20
	\bar{X}	4-3	4-0	4-9	4-6	5-0	3-11	4-4	4-3
Peabody Picture Vocabulary Test	SD	1-2	0-9	1-3	1-5	1-4	1-3	1-4	1-4
MA (years and months)	Med.	4-4	4-1	5-4	4-7	5-4	3-10	4-5	4-1
	High	6-10	5-10	6-10	6-10	6-10	5-10	6-10	6-10
	Low	2-3	2-3	3-2	2-2	2-4	2-4	2-2	2-2
	\bar{X}	70.6	65.6	78.3	75.8	85.6	65.1	73.2	74.8
Peabody Picture Vocabulary Test	SD	20.8	18.0	22.7	23.2	21.5	20.1	22.2	22.2
IQ	Med.	68.0	68.0	87.0	76.0	91.0	65.0	74.0	70.0
	High	121.0	97.0	121.0	121.0	121.0	96.0	121.0	121.0
	Low	36.0	36.0	53.0	35.0	41.0	35.0	35.0	35.0
	\bar{X}	14.9	15.1	14.6	14.3	15.7	12.9	14.6	13.7
Raven's Raw Score	SD	2.3	2.6	1.6	3.5	3.7	2.0	3.0	3.0
	Med.	15.0	15.0	14.0	14.0	16.0	13.0	14.0	14.0
	High	19.0	19.0	18.0	22.0	22.0	16.0	22.0	18.0
	Low	11.0	11.0	12.0	9.0	10.0	9.0	10.0	9.0

of 6 years 10 months. The two high scorers in the posttest in the comparison group, listed on Table V were English-speaking, one of whom was an American Negro, the other a white child. Individual factors and chance factors tend to reduce the significance of data from small samples.

There is good reason to believe that scores are understated in both groups because of problems of language comprehension and test know-how. This would suggest greater understatement on pretests for both groups than on posttests, since some progress can be assumed to have occurred over the 7-month period in language comprehension and test know-how would be expected to be greater on tests given after the first one.

There is also good reason to believe that the score increases in the demonstration group are understated, to a greater extent, than in the comparison group. The two researchers, with long experience in teaching and working with young children, took pains to establish rapport with each child tested. However, they shared the testing with several psychology students, who had considerably less experience with children.¹⁰ To equalize the effects of different testers, it was arranged that the two researchers would do most of the pretesting in the demonstration group, with whom there had been little individual contact before the study began, and most of the posttesting in the comparison group. Detailed study of the scores and comparison with observations of individual children in the demonstration group over the 7-month period suggest that the scores of the latter may be somewhat understated on the posttests, while the scores of the former may have been equally understated on the pretest. Instead of equalizing effects, there may have been unequal effects on the difference in scores between the two groups, in favor of the comparison group.

A further indication of the testing problems in the comparison group was the refusal of several children in this class to be tested on the pretests, until they were persuaded after unsuccessful efforts. There were no such refusals on

10. Earlier funding of the study would have permitted the employment of more experienced personnel. The services of these psychology students were available through Brooklyn College sources.

Table IV

Demonstration Group: Listing Of Scores On Peabody Picture Vocabulary Test And Raven's Coloured Progressive Matrices, Pretests And Posttests, By Child, By Age And Sex

Sex	Age at Pretest -months	Peabody Picture Vocabulary Test				Raven's				Gains
		MA-years and months	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	MA-months	
Boys	1*	67	2-4	4-2	70	12	15	+24	+3	
	2	67	2-9	4-9	43	22	13	-1	+1	
	3*	68	2-6	3-7	44	10	16	+13	+6	
	4*	64	2-4	2-11	44	39	10	0	+1	
	5*	65	3-11	3-10	72	64	11	-1	+4	
	6*	69	2-4	3-1	41	49	15	+9	0	
	7*	67	2-8	2-3	48	36	10	-5	+4	
	8	69	6-6	5-4	113	94	12	-14	+1	
	9	59	2-10	4-9	53	86	11	+23	+2	
	10	65	4-1	4-11	75	82	17	+10	+1	
Girls	11*	67	2-6	4-9	45	76	17	+27	+1	
	12	65	5-1	5-10	94	97	9	+6	+7	
	13	68	3-6	4-4	62	68	13	+7	+4	
	14*	59	2-9	3-8	56	67	7	+12	+5	
	15*	66	2-4	3-5	42	55	11	+13	+5	
	16	62	2-11	5-4	56	93	13	+29	0	
	17	68	3-11	3-8	69	58	15	-3	0	
	18	67	4-8	5-3	84	91	13	+12	+1	
	19	64	2-8	5-6	50	92	14	+34	0	
	20	69	2-3	3-6	39	55	15	+15	-3	
	21	60	3-8	6-10	73	121	13	+33	+5	
	22	64	2-9	3-2	52	53	7	+5	+1	
	23	69	4-5	5-6	77	87	13	+13	-1	
	24	69								

* indicates bi-lingual children

Table V

Comparison Group: Listing of Scores On Peabody Picture Vocabulary Test And Raven's Coloured Progressive Matrices, Pretests And Posttests, By Child, By Age And Sex

Sex	Age at pretest -months	Peabody Picture Vocabulary Test				Raven's Raw Score				Gains	
		MA-years and months		TQ		Pretest		Posttest		MA-months	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Raw Score	Raw Score		
Boys	1	61	4-3	5-6	34	97	14	22	+15	+8	
	2	58	4-0	4-11	33	85	11	13	+11	+2	
	3	64	4-3	5-6	30	93	15	16	+15	+3	
	4	59	5-7	6-8	114	121	11	13	+13	+2	
	5	66	4-7	5-4	83	88	14	18	+4		
	6	61	4-0	5-3	79	93	11	17	+15	+6	
	7	68	4-11	6-2	87	99	13	14	+15	+1	
	8	67	4-7	6-10	32	111	16	22	+27	+6	
	9	59	2-8	3-1	54	56	8	13	+5	+5	
	10	60	2-5	3-10	48	69	12	10	+17	-2	
	11	66	3-7	4-6	65	74	13	17	+11	+4	
	12	65	2-0	2-4	37	41	7	11	+4	+4	
Girls	1	63	1-11	2-4	37	41	6	12	+5	+6	
	2	64	2-7	3-10	48	65	10	11	+15	+1	
	3	64	2-4	2-8	44	46	10	13	+4	+3	
	4	67	3-7	5-10	64	35	5	13	+27	+3	
	5	68	3-9	5-1	66	81	4	15	+16	+11	
	6	61	4-5	4-4	107	76	11	12	-13	+1	
	7	68	2-4	3-0	41	48	9	9	+8	0	
	8	64	2-8	3-6	50	59	9	12	+10	+3	
	9	64	4-5	5-8	83	96	15	16	+15	+1	
	10	68	2-0	2-9	35	35	11	15	+2	+4	
	11	67			49	74	11	14	+22	+3	

the posttests in this group, nor were any such difficulties encountered in the demonstration group on either the pretest or posttest. The apprehension or reluctance to be tested, evidenced by some of the children in the comparison group on the pretests, may have contributed to some of the incredibly low pretest scores in this group. This would be another cause of a spuriously large score increase from pretest to posttest.

Despite the low mean scores in both groups on the PPVT, it is encouraging to note that on the Raven's matrices, 6 children in each group achieved scores of 17 or better on posttests, as shown on Tables IV and V. A raw score of 17 on the Raven's, for this age group, falls at the 75th percentile. A score of 13, which is placed at the 25th percentile, and scores under 13 were recorded for only 7 children in the comparison group and 4 in the demonstration group.

However, comparison of scores on both tests between the two groups, listed on Tables IV and V, gives further confirmation of the greater language handicaps in the demonstration group than in the comparison group. The following posttest scores are given, for the 6 highest scorers on the Raven's test in each group:

Demonstration Group		Comparison Group	
Raven's	PPVT-MA	Raven's	PPCT-MA
19	4 yrs. 9 mos.	22	5 yrs. 6 mos.
18	4 yrs. 11 mos.	22	6 yrs. 10 mos.
18	4 yrs. 9 mos.	18	5 yrs. 6 mos.
18	6 yrs. 10 mos.	18	5 yrs. 4 mos.
17	3 yrs. 2 mos.	17	5 yrs. 3 mos.
17	4 yrs. 4 mos.	17	4 yrs. 6 mos.

This listing tends to support the detailed observations of the researchers of the considerably greater English language deficits in the demonstration, as compared with the comparison group. The mean test results of the PPVT may indicate that the gains, which might have been expected in the comparison group, were unexpectedly high for the demonstration group,

with its severe problems of English comprehension and vocabulary. If so, the emphasis in the study on language and conceptual growth may be regarded as contributing to significant progress for children who might otherwise have made little progress, or whose scores might have shown continuing declining trends.

Another indication of the difference in scores between the two groups may be found in the summary on Table I. Here, it should be noted that, on posttests, the comparison group had slightly higher MA scores on the PPVT, 4 yrs. 6 mos. vs. 4 yrs. 3 mos., but the demonstration group was slightly ahead on the Raven's raw score, 14.9 vs. 14.3. However, the demonstration group actually showed a faster rate of gain on the Peabody, 30% compared with 28%, while the comparison group led in rate of gain on the Raven's, 34% compared with 22%. These differences may be more reflective of regression to the mean effects, than of progress in academic aptitude. There are no significant differences between the mean post-test scores for the demonstration and comparison groups.

The high rate of gain on the PPVT-MA, for girls in the demonstration group, is shown on Table I, at 44%. No such startling difference appears between the means for boys and girls in the comparison group. The demonstration group had fewer girls than the comparison group, 10 compared with 12, and this small population may simply be showing the effects of one or two extreme score changes. However, other researchers have noted greater learning gains for girls than for boys in school programs. Should such a trend be substantiated, it should alert the school and curriculum designers to a school bias which may call for some fundamental changes.

Most researchers have found some advantage in kindergarten training, comparing children who enter first grade with or without a prior year in school. Fast, for example, comparing two groups, one of which lacked kindergarten experiences and with no significant difference in socio-economic status, found significantly higher scores on reading tests administered at the beginning, middle and end of the first grade.¹¹ While she described the school's kinder-

11. Irene Fast, "Kindergarten Training and Grade I Reading", Journal of Educational Psychology, Vol. 48, January 1957, pp. 52-57, p. 56.

gartens as "traditional," without any formal reading program, it is probable that the "traditional" "reading readiness" programs usually featured by such kindergartens contribute substantially to children's learning how to take tests, among other learnings.

In a Status Report of O E Project No. 2648, Professor Horn of the University of Texas noted, after several months of instruction in his experimental program of language instruction for Spanish-speaking children beginning school in the first grade, "The inappropriateness of test instruments for this population is borne out by failure of most pupils in the current project to score even in the measurable range of mental ability and reading readiness."¹² He noted the need for new tests of language ability.

Test Problems

The appropriateness of the Peabody test for disadvantaged children has been questioned by many researchers. Gray, specifying problems in testing and interpretation of scores on the PPVT with disadvantaged children suggests that problems chiefly center in rapport, in use of appropriate language by the tester and, above all, she says, "in allowing sufficient time for the youngsters to respond."¹³ Gray also noted the extremely large variances on this test. The researchers' experience in this study casts further doubt on its usefulness, either to measure language progress or school aptitude. It is worthless as a diagnostic tool, since it is impossible to pinpoint children's language or intellectual needs, from the scores. It can be expected that posttests will show "progress," or change for the better, but it can not be reliably determined that these changes reflect more than growing test know-how and the regression to the mean effect.

12. Thomas D. Horn, "Basic and Applied Research Proposal", Resubmission of Proposal #3095 to the U.S. Commissioner of Education under the Provisions of Public Law 531, Austin, Texas, The University of Texas, August 4, 1965, Appendix ix, mimeographed.

13. Susam W. Gray and Rupert A. Klaus, "Early Training Project: Interim Report, November, 1963", George Peabody College For Teachers, 1963.

The Raven's test involves similar problems, although Vernon points out that, "...British g factor very regularly shows its largest loadings on tests like Progressive Matrices."¹⁴ Burke, who questioned whether the Raven's test is a pure test of Spearman's construct, g, or whether any test could be, noted that it had been a useful tool in the study of growth and deterioration of mental efficiency and that it shows intercorrelations with the Binet or Wechsler almost as high as they show with each other.¹⁵

Nevertheless, it would appear that tests such as the Raven's or the Peabody, which require considerable verbalization and explanation on the part of the tester, should probably be avoided in assessing progress of disadvantaged young children with severe language problems. Gage and Naumann suggest that special data may be needed for specialized groups, such as non-white or handicapped populations.¹⁶

Other studies, which show I.Q. gains on standardized tests for disadvantaged children, often fail to assess a comparison group under similar circumstances, obscuring the extent to which posttests tend to differ from pretests so largely due to improved rapport or test-wiseness.

14. Philip E. Vernon, "Ability Factors and Environmental Influences", American Psychologist, Vol. 20, No. 9, September, 1965, p. 726.

15. Henry R. Burke, "Raven's Progressive Matrices: A Review and Critical Evaluation", Journal of Genetic Psychology, 1958, 93, 199-228, pp. 221-222.

16. Gerald E. Gage and Theodor F. Naumann, "Correlation of the Peabody Picture Vocabulary Test and the Wechsler Intelligence Scale for Children", The Journal of Educational Research, Vol. 58, No. 10, July-August, 1965, p. 467.

While the standardized tests fail to show an advantage for the demonstration group over the comparison group, unless the language handicap is given weight, a wealth of data is presented in the succeeding chapters which specify the kinds of progress made by the demonstration group during its kindergarten year. It cannot be said that the demonstration group wiped out all its deficits in this year. It can be said, however, that the study is replete with multiple learnings achieved and perhaps even more important, the development of work-oriented and school-oriented attitudes in the children and, to some extent, in their parents. If the school were enabled to maintain the momentum and the motivation of the kindergarten year, adequate language and conceptual growth could be confidently predicted.

It must be noted that, even had the standardized test data shown a clear superiority for the demonstration group, it could not be claimed that experience within a single classroom constituted definitive proof of the claimed advantage of the program. Since so many variables were uncontrolled in the demonstration group, notably what may be the single most decisive factor, the teacher's personality and impact on children's motivation and learning, this study was not expected to provide proof of the claimed superiority of the program. As it was stated in the proposal submitted for funding, "The variables of teacher, school climate, classroom materials and equipment and other school resources can not be controlled in a program centered in one classroom. However, the details and results of this demonstration program are essential to the orientation and re-training of a group of teachers as well as for future experimental testing."

The test results can therefore be regarded as constituting no barriers to further development of the program or to its future experimental testing. The study contributed to development of a program which can now be specified in great detail for classroom implementation, with results which are encouraging and optimistic of an accelerated rate of increase in aptitude for academic success. However, longitudinal assessment, in an experimental study, would be required for adequate evaluation.

CHAPTER IV

Social Science Concepts

A major emphasis of the demonstration project was on children's development of some initial social science concepts. The social science concepts selected for the pilot study were retained for the demonstration study which followed. They were:

1. Specialization as a characteristic of our society.
2. Interdependence as a characteristic of our society.
3. Cultural pluralism as a value in our democratic society.

After considering several topics which might serve as interesting and stimulating vehicles through which to build the beginnings of the selected concepts, the researchers and the teacher selected "air transport" as the focus for study. The researchers thought that, because many of the children had cultural roots in Puerto Rico, with air travel a common experience in their community, they would find interest in such a topic. This topic also seemed to have good potential for extending children's contacts and experiences beyond the narrow limits of their own neighborhood. It was understood, however, that it was the teacher's responsibility to help the children develop a genuine interest in the topic. Had she been unsuccessful, another focus would have been selected. This content was seen as related to the concept of cultural pluralism, but it was not intended to place any limitations on the exploration of ways to build toward that particular concept, or any other.

Study of Air Transport

With air transport as a focus, the selected concepts were translated into more specific terms, or sub-concepts, that could lead more directly to curriculum planning by the teacher. It was decided that selections would be made from among the following sub-concepts:

Specialization

1. There are special names for air transport jobs, such as:
 - a. Pilot or captain
 - b. Co-pilot
 - c. Stewardess
 - d. Mechanic
 - e. Meteorologist
 - f. Reservation or ticket clerk
 - g. Porter
 - h. Flight engineer
2. Many workers in air transport wear special uniforms.
3. Some important air transport jobs are those of:
 - a. Captain (progresses from co-pilot to captain) who flies the aircraft and is responsible for the safety of its passengers and cargo.
 - b. Co-pilot who assists or relieves the captain in the operations of the aircraft.
 - c. Flight engineer who sees that the mechanical and electronic devices of an aircraft are in perfect working order and makes repairs in case of emergency.
 - d. Stewardess or steward who caters to the needs and comforts of passengers during a flight.
 - e. Flight Dispatcher who authorizes all take-offs of aircraft and monitors by radio their progress to destinations.
 - f. Meteorologist who prepares reports on weather for airline flight personnel and for airline operations and traffic departments.
 - g. Mechanics are specialists who repair and maintain various parts of the aircraft. Each has a special designation in relation to his special responsibility.
 - h. Reservation agent who makes reservations for passengers, operates automatic reservation devices, and keeps appropriate records.
 - i. Porters handle baggage of passengers. (While they are not considered air transport personnel by the air carriers, they were so considered, functionally, in the study.)

The preceding job designations were selected from among a more extensive list secured from one of the major airlines. There was no requirement that all of these job specialties be incorporated into the children's program.

Economic Interdependence. Sub-concepts:

1. Passenger and freight air transport:

- a. Transport means moving people or things from one place to another by plane.
- b. Passengers are people who are being transported. They need tickets. They may also have baggage to transport.
- c. Freight consists of objects or things to be transported.

2. Purposes of air transport:

- a. People move from one place to another for many reasons. For example, to work, to go on vacation.
- b. Things are moved from one place to another for many different reasons. For example, food grown in one place and customers in many places; air-mail between distant places.
- c. Air freight provides quick transportation for lightweight and valuable objects.

3. Interdependence of people:

- a. People depend on workers in air transport for fast movement of passengers and freight.
- b. Air transport workers depend upon many other workers. For example, workers in taxi, bus, truck and other kinds of transport bring people and things to and from airports.
- c. Air transport crews depend on maintenance and service workers to help keep planes in condition for flying and to provide airport services.

Cultural Pluralism

- 1. People from other countries come to our country by air transport.
- 2. Some airline workers have to speak other languages in order to talk with passengers who do not speak English.

3. Air travel helps people from different parts of our country to know each other better.
4. Workers in air transport come from many different kinds of families.
5. People of all races, religions, and cultures have contributed to American culture, and all cultures have value. Most cultures share a few basic values but have some unique values of their own.

These sub-concepts, which helped to define more specific aspects of the three broader key social science concepts, were viewed as necessary to give direction to specific curriculum planning. From among them, sub-concepts which seemed fruitful for play, observation, discussion, and development of materials for kindergarten children were selected. Frequent reference was made to them as guides for curriculum planning, and these sub-concepts will be used as a basis for evaluation of this part of the demonstration project.

Word Definition Test

Data on the social science concepts of the study were provided by two sources: a test of word definitions and observational records. The word definition test was constructed by the researchers on the basis of words that were centrally related to the focus of the study.

Since language growth was considered a primary goal of the new curriculum, and since emphasis on language was viewed as an integrated aspect of the curriculum, an effort was made to measure growth in vocabulary, and especially in comprehension, related specifically to the selected social science sub-concepts for the topic "Air Transport." The same word definition test of six items was administered individually to the children in both the demonstration and the comparison classes as pre- and posttest. The key for scoring this test appears in Appendix A. Results were scored independently by each researcher with 97% agreement, with subsequent accord on remaining scores.

The test words were included in a simple narrative placed in the context of a trip to the airport. For example, the investigator would begin to talk about her trip to the airport and would then say, "There at the airport, I saw a big jet.

What's a jet?" The words which children were asked to define in this test were: hangar, jet, pilot, control tower, refueling and loading baggage. It was anticipated that some, if not all, these words would gain meaning through the experiences and activities provided in the study.

Test Results

It is interesting to note in Table VI the very low mean scores for both groups on the pretest. With a maximum possible score of 18, the means were only 1.5 for the demonstration group and 2.0 for the comparison group. Since the demonstration group was more heavily weighted with Spanish-speaking children, their lower score would have been expected.

On the posttest seven months later, there was a gain of 4.3 in the demonstration group, with a posttest mean of 5.8.¹ The comparison group, on the other hand, with a mean of 2.5, showed a gain of 0.5, which was not significant. Considering the added language handicap of the demonstration group, which was by no means overcome by the Spanish-speaking children in this short period of time, their gain was substantial.

It is noteworthy that the curriculum of the comparison group included "airplanes and the airport" in a more conventional way. Since both groups studied this topic, it is possible that the new curriculum, requiring different teaching strategies by the teacher, had a positive effect in helping children increase their vocabulary as a function of gaining greater understanding of the social science sub-concepts of that curriculum. Of course, the possibility cannot be ruled out that, not the curriculum but the teacher personality was the chief source of variation here. Further testing on randomly-selected groups would be required before it could be substantiated that the new curriculum could be relied upon for superior results, on the average.

1. $P < .0005$.

Examining the scores for each of the six items in Table VI, it is evident that the gains made were limited to these four: "jet", "pilot", "refueling", "loading baggage". Very little attention was given to incorporating ideas about "hangars" or "control towers" into the fabric of play or structured experiences of the demonstration group. On one of the trips, the control tower was pointed out in the distance, but a clear view of it was unattainable. Some thought was given to having the children build small planes from wood which might then lead to the need for a hangar in which to store them. However, because of time limitation, this activity never developed and no "hangar" play or discussion occurred. On the other hand, play, guided discussion, role-playing and structured activities which revolved around beginning concepts of "jet, pilot, refueling, loading baggage" characterized a substantial part of the social science curriculum which will be described extensively later in this chapter.

Observational recordings illustrate considerable play involvement with pilots, jets and, after the second airport trip, with baggage. Gains for these items, compared with the lack of gain in understanding meaning for "hangar" and "control tower," suggest the high potential for language growth through extensive play integrated into a program with clearly defined goals and appropriate teaching strategies. Despite the language barrier for the Spanish-speaking children in the demonstration group, they showed a gain of 48 points as against 7 points in the comparison group for the word "pilot," which was the item of highest gain for both groups. For the items "jet" and "loading baggage" the gain for the demonstration group was 23 and 21 points respectively against 1 point for the comparison group for each item. The total score gain for the demonstration group was 106 or 27% compared with a score gain of 9 or 3% for the comparison group.

When one considers that the topic "air transport" may be thought of as culturally more relevant to boys, it is particularly interesting to examine the results in terms of scores for boys and girls. Table VII shows that the four highest posttest scores of 11 and 9 (with two subjects each) were by girls in the demonstration group even though on the pretest the highest score of 6 was made by a boy in the comparison group. This table also shows the score gains in the demonstration group were almost the same for girls and boys, 26% and 28% respectively. In the comparison group, while the boys showed a small gain and the girls a slight loss in scores, the difference was not significant.

Table VI

Word Definition Test: Raw Scores By Item and Sex,
Demonstration and Comparison Groups, Pretest and Posttest

Item Group	Pretest			Posttest			Gain		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
All Items									
Dem.	38	16	22	144	78	66	106	62	44
Com.	50	29	21	59	44	15	9	15	-6
Jet									
Dem.	33	15	18	56	32	24	23	17	6
Com.	38	22	16	39	25	14	1	3	-2
Hangar									
Dem.	0	0	0	1	0	1	1	0	1
Com.	0	0	0	0	0	0	0	0	0
Pilot									
Dem.	1	1	0	49	32	17	48	31	17
Com.	5	5	0	12	12	0	7	7	0
Control Tower									
Dem.	0	0	0	0	0	0	0	0	0
Com.	0	0	0	0	0	0	0	0	0
Refueling									
Dem.	0	0	0	13	5	8	13	5	8
Com.	3	2	1	3	3	0	0	1	-1
Loading Baggage									
Dem.	4	0	4	25	9	16	21	9	12
Com.	4	0	4	5	4	1	1	4	-3

Table VII

Word Definition Test - Scores for Demonstration and Comparison Groups, Means and Individual

Demonstration Group				Comparison Group			
Subject	Pretest	Posttest	Gain	Subject	Pretest	Posttest	Gain
All Mean Scores	1.5	5.8	4.3	All Mean Scores	2.0	2.5	0.5
Boys Mean	1.2	5.1	3.9	Boys Mean	2.1	3.7	1.6
1	0	6		a	3	3	
2	0	6		b	3	1	
3	3	7		c	1	3	
4	0	3		d	3	7	
5	1	7		e	1	1	
6	0	6		f	5	8	
7	0	7		g	6	7	
8	1	6		h	4	7	
9	1	1		i	0	3	
10	3	7		j	1	3	
11	1	7		k	0	1	
12	3	5		l	2	*	
13	3	7		m	0	0	
14	*	3					
Girls Mean	2.0	6.6	4.6	Girls Mean	2.0	1.3	-0.7
15	2	4		n	3	3	
16	5	11		o	0	0	
17	3	1		p	1	0	
18	3	4		q	3	0	
19	0	9		r	3	2	
20	3	*		s	3	2	
21	0	5		t	3	1	
22	0	8		u	1	0	
23	3	11		v	0	0	
24	0	*		w	1	4	
25	3	4		x	0	0	
26	2	9		y	3	3	

* - child not on roster in this period of testing

The observational data were analyzed in relation to the sub-concepts listed above under the three selected social science concepts as they apply to the topic of air transport. The following analysis uses illustrative material from these observations as they relate to concepts of specialization, interdependence, and cultural pluralism.

Specialization

During the last week of October, the teacher introduced the topic of airplanes rather conventionally by reading a book entitled I Want To Be An Airplane Hostess.²

Deficits in Children's Concepts

In the discussion that followed the story, it was evident that children had many misconceptions about the jobs which people do in air transport. They also lacked vocabulary specific to air transport activities and jobs. They did not know the term "pilot" for the person who flies the plane. After extended discussion, in reference to picture clues of the activities of the stewardess or hostess, children still said, "She drives the airplane." In response to the teacher's question about the illustrative picture of the porter weighing baggage, the children said he was, "fixin' it," meaning that the porter was fixing the plane.

After reading a description in a story about the stewardess preparing lunch, the teacher asked the children what the stewardess was doing in the picture. Most children did not know. One said, "She's warming it up." Neither the label "stewardess" nor the word "food" was used. During the play period which followed, in which suggestive costumes such as stewardess caps and pilot hats were available, several of the children wore them, but no discernible dramatic play about airplanes developed.

2. Carla Greene, I Want To Be An Airplane Hostess, Chicago, Children's Press, 1960.

The following day, the teacher read another book concerning airplanes. In discussion, it was apparent that children still had misconceptions about the work of pilots, stewardesses and porters and lacked the vocabulary to identify them. They referred to them as "mother, father, man." Only one of the children used the name "stewardess" correctly.

Several children began to show interest in the topic. They examined the books about airplanes, asked questions about the illustrations, looked at photographs on display, drew airplanes, and wore the hats and caps which were parts of costumes available for play. Subsequent discussions revealed continued confusion about who builds an airplane, and what the pilot does. Children thought the stewardess had to buy a ticket before boarding the plane and the pilot was usually assumed to be the ticket collector.

By the end of the second week, several boys were building a simple airplane structure in the block corner and using the newly introduced wheel prop in their play. The wheel was placed on the section identified as the wing. Other children also built small structures which they planned as "airplanes" in the enlarged block area. Seats were placed inside and the teacher and other children were invited to sit in the plane. The stewardess was asked for food and told to sit in the back of the plane, which she did, without responding to the idea of serving food.

During the third week, airplane play became a dominant activity and involved, at one time or another, a majority of the children in the class. Additional props such as flight jackets for the pilots, flight bags for the stewardesses, and "tickets" were eagerly sought and used in play. Play patterns assumed more continuity and inter-relations. Generally, a block structure was identified as a "plane"; the wheel was placed in a position in the front of the plane where a special seat was placed. Sometimes blocks were identified as "seats." Then costumes were donned, exchanged frequently, and driving motions at the wheel were accompanied by "airplane sounds." "Tickets" in the form of small slips of paper were furnished by the teacher and were held by children "boarding" the plane.

However, observation notes during this period reflect almost no use of vocabulary related to air transport and its personnel except for frequent use of the terms "plane" and "wheel." At this point, during the fourth week, the first trip to Kennedy Airport took place. The express focus of the trip was to see the inside of a plane, some of the people who work in air transport, and to observe the role of the stewardess, the ticket agent, and the porter. It was evident from preparatory discussions that children still lacked information and vocabulary to communicate about personnel in air transport and their jobs.

Increased Use of Terminology

Following the trip, there was heightened involvement in airplane play in the block building and housekeeping areas. There was an increased use of terminology related to the topic in the children's dramatic play. These comments are typical of changing language:

"I'll be the captain and you be the captain; where are the stewardesses? Do you want to be a stewardess? Put on your seat belts. You can't eat now, wait for the stewardess, now put on his seat belt. Hey, you need a ticket to get on a airplane."

A week after the airport trip, a teacher-guided discussion took place to prepare a children's newspaper report to their parents about the trip, which is described in Chapter VI. The discussion served to clarify some ideas about which the children had indicated much confusion.

More Complex Play

With the addition of other props, often suggested by the direction of children's play, the play became more complex and provided for increased practice in the use of newly acquired terminology. When a few children began to "talk into" a small block, the teacher offered a small orange juice can on a thin dowel as the "microphone." With the addition of a real set of earphones, the children used the jack as a microphone. The words "earphones" and "microphone" were used frequently in related play.

More abundant detail became evident in airplane play. The plane structure, built out of blocks, advanced to designs that had a pointed front, sides made of blocks, a tall section in the back sometimes referred to as the "tail" and regular rows of chairs to which "seat belts" were attached. The front of the plane, separated by a block formation, generally contained the "cockpit" or seats for the pilots or captain and co-pilot, a wheel, an instrument panel with moveable parts, maps, and sometimes a globe. The seat belt was a long strip of yellow felt with 3-inch rings sewn to the ends, for easy interlocking.

Stewardesses often incorporated into their play activities of food preparation and tray services to passengers and crew. They also fastened seat belts for passengers or checked to see that this little detail had been taken care of by the passengers.

On the day that a child, wearing the "porter" hat, placed blocks on a hand truck, wheeled them around, and piled them onto the plane, identifying them as suitcases, the teacher provided two small real suitcases for more realistic activity. Soon, the porter's uniform, props, and activities became a popular aspect of airplane play. Girls dressed as ladies stuffed clothes into suitcases and took them onto the plane in their role as passengers. Boys packed suitcases with vests, ties and shoes, carried them about and talked about going on the airplane. Sometimes suitcases were given to the porter who put them on the hand truck, wheeled them around the room and put them on the plane.

Early in January, a table was set up near the block area with strips of paper, pencils, and felt pens. A sign, "ticket clerk" was explained by the teacher and the area was designated as a place to get tickets. Prior to this, the teacher would occasionally furnish slips of paper for tickets, as needed. Several children spent considerable time "writing" on the tickets without any passenger involvement in the play. In the next few days, "ticket clerks" spent much time copying children's names from an adjacent name chart onto "tickets" with very little conversation between them.

Discussions during this period revealed that children had no clear ideas of how tickets were used in airplane travel, or what information was contained on tickets and why. Excerpts from a transcribed taped discussion show some of the children's ideas at this stage:

Teacher: Before you go on an airplane, what do you do?
Child: Give your ticket.
Teacher: Yes. Where do you get a ticket from?
Child: Stewardess.
Child: Ticket clerk.
Teacher: Somebody said "stewardess." How many think we get a ticket from the stewardess?
Children: (many voices) Yeah.
Teacher: You get a ticket from the stewardess?
Child: The stewardess give it you.
Teacher: No, she doesn't. You have to go buy your ticket from the . . .
Child: Ticket clerk.

Teacher: What must you put on the ticket? (now discussing ticket clerk play)
Child: The number.
Teacher: What else?
Child: The name.
Teacher: What else?
Children: I don't know.
Child: The captain.
Child: The ticket clerk's over there and the stewardess come and the stewardess write her name.
Teacher: What for?
Child: For the pilot.

Observation of dramatic play indicated much interest in the porter's role and passengers' baggage, but no ideas that other items, such as freight, are also transported by planes.

To extend children's interest and build a firmer base for developing concepts about specialization in air transport, a second trip to the airport was planned. The emphasis of this trip was on observation of the activities of the ticket clerk and on the ways in which baggage and air freight were handled. During the trip, observation and discussion of these particular aspects of air transport consumed most of the time. Still photos and motion pictures were taken of the children and of the air transport activities observed, for later identification, for clarifying observations, and for recall.

When the colored transparencies of the trip were shown to the children, their enthusiastic comments demonstrated the usefulness of the visual materials in stimulating verbal recall of the activities which they observed. They pointed out the ticket clerk, suitcases, baggage, passengers, baggage moving on a belt into the plane, the process of refueling the plane, the cockpit where the pilot and co-pilot sit, the conveyor belt which takes the passenger's suitcase down to the field after it has been weighed by the ticket clerk. Terms such as "passenger, suitcase, baggage, pilot, ticket clerk" were used frequently and correctly by many children in the class.

In the next three months, the air transport play continued to develop in complexity and detail. At times, a sequential progression showed growing understanding of the realities of air travel. For example, "passengers" would dress up in grown-ups' clothing, pack suitcases with items of clothing, carry them to the ticket counter where they asked for a ticket. The "ticket clerks" would make out tickets, write the passenger's name on them, the suitcase would be weighed on a scale, tagged in some way, and carried by hand truck to the airplane while the "passenger" boarded the plane carrying only her "baby." The "stewardess" would help the passenger fasten the seat belt if necessary, or check to see that it had been done. The pilot and co-pilot talked about getting ready to take off, appeared to receive important directions through their earphones, used the wheel, the instrument panel, and maps. They talked to the passengers about where they were flying, where they would land, how much time it would be before landing. Stewardesses fixed trays of "food" for the crew and for passengers, distributed them, collected trays, and sat in the back of the plane when not working.

Although there were many times when play and activities unrelated to air transport held the attention of the children, it was evident that, whenever they returned to this topic throughout the remainder of the year, their play continued in its more complex and realistic forms.

Symbols

The exploratory study made it clear that the children had little comprehension of the significance of symbols as a way of gaining, storing, or utilizing information. The demonstration project, therefore, was concerned with establishing a variety of ways in which children would be encouraged to notice and identify symbols, to utilize them in their play, and to develop a sense of pride in a growing ability to recognize them both in play and in structured activities.

Opportunities were made to use labels to identify uniforms. When signs that could be worn over the head were supplied for "ticket clerk," "mechanic" and "passenger," children, at first, asked the teacher for the sign they wanted. Before long, they were able to select the appropriate sign for these roles themselves.

Early in the year, several routines were evolved that required children's recognition of their own names. When the area for the ticket clerks was established near the block corner, the name chart and later a numeral chart were within easy reach. At first, "ticket clerks" made random marks on "tickets" for "passengers." Soon passengers asked to write their own names on tickets and took much pride in being able to do so, generally copying from the chart. Eventually, "ticket clerks" were able to recognize names of "passengers" on this chart and sometimes copied them onto tickets. They also wrote various numerals on the tickets, often checking the chart for correct formation.

By the middle of January, the teacher placed a large chart near the block area with pictures and labels for baggage, hand truck, tickets, microphone, seat belt, earphones, passenger and flight bag. Within a month, about half of the children had drawn pictures about air transport and the teacher had written the desired label for each. These pictures were displayed on a side wall and the teacher, in a guided discussion, would have children identify their illustrations and "read" the labels on their pictures as the teacher pointed to them. Some children were able to do so while others could not.

In February, while viewing slides taken on the second airport trip, some of the children recalled symbols they had seen and their use. For example:

Child: (referring to signs "in" and "out" in English and in Spanish beside the lunch counter)
People are hungry when they go on the airplane so they eat there. That (the signs) tell people to go in and out.

Teacher: Those signs are in English and Spanish. Why do they make English and Spanish signs?

Child: To tell people to go in and out, where to eat.

Child: That's the ticket clerk. The ticket clerk makes the ticket and the numbers. He's putting down the name. The number.

Teacher: What else does he write on the ticket?

Child: Where to go.

At times, children demonstrated an interest in numerals and clocks as symbols for communicating about time and a growing understanding of their function. In the second month of the study, children used felt wristwatches as props in airplane play, but not in relation to time. For instance, one boy, playing "captain" looked at his "watch" saying, "6-5-8-2-1." Another "talked into" his "watch" as if it were a microphone. By February, children were referring to play watches and talking about time, such as, "Nine more minutes, then ten minutes to go down."

After some planned instruction in relation to clocks and telling time unrelated to air transport, children were able to use their growing understanding that time, as measured by a clock, gives people clues as to what they do at certain times. In a discussion about the projected real airplane trip of a visitor from Maylasia, the children recognized 5 o'clock as a time for eating dinner, 11 o'clock as time to sleep, 8 o'clock in the morning as time to eat breakfast. Aside from perceiving numerals on clocks as time-measures, they also made an association between the numerals on a scale and the weight of baggage.

The introduction of a globe and maps as props in air transport play elicited much interest. At first, maps were folded and unfolded without verbal or dramatic relevance to their function. The globe was spun vigorously, in the beginning, apparently for its manipulative value. Later, some comments indicated greater awareness of the meaning of these symbols, such as: "To tell the pilot how to go"; "Wonder where we are" - while looking at the globe; (the map) "shows if you're going the right way." Children also looked at the globe and asked where certain countries were, particularly countries which had been discussed at other times in different contexts.

The project focussed directly on word symbols, number symbols, conventional and arbitrary symbols in relation to other facets of the curriculum. It is relevant to note, in this chapter, only those data which refer directly to responses which indicate growing awareness of symbols as they emerged in connection with air transport topics as related to the social science sub-concepts which were the learning goals.

The test of word definitions furnishes one specific clue to the extent to which the children in the demonstration group were able to develop meaningful concepts about a few areas of air transport. This test required verbalization of a few meanings. The observations cited above indicate considerable progress in the group toward some of the learning goals listed as sub-concepts under specialization. The sub-concepts on which most progress was made were those specifying special names and functions in air transport, the association of specific uniforms with job titles and functions and, especially, the occupations of pilot, stewardess, ticket clerk, mechanic and porter.

Interdependence

The early activities revolved around building and driving the airplane in the block area, with little involvement of passengers in the play. In fact, it was not until the teacher participated in the play during the third week, indicating she wanted to go somewhere in the plane that was being

built, that there was any indication that people are transported by plane. Shortly thereafter, following the children's first trip to the airport when they were permitted to sit in a real plane, the dramatic play in the classroom expanded to include passengers.

Role of Passengers

Although the term "passenger" did not appear in the observational records of children's play until later in the project, the role of passengers became an essential one in air transport dramatic play immediately after the first airport trip. Stewardesses were frequently dispatched by pilots to ask children to ride in the plane after it had been built. Children willingly sat in the plane, allowed stewardesses to fasten their seat belts, secured tickets from stewardesses, and later from ticket clerks, before boarding the plane, and generally played passenger roles. Pilots frequently carried on conversations with passengers about where they wanted to go or where the plane was going and where they wanted to get off.

With the introduction of suitcases into the play, passengers became more active in their role. They used the dress-up clothes, played "lady" and "mother" taking a trip, and spent much time packing suitcases and dressing for the journey.

It was not until after the second trip to the airport that the term "passenger" came into regular use to designate the role. In viewing the slides taken at the airport, a child defined "passenger" as follows:

Teacher: (re picture at ticket counter) Who are all those people?
Children: Passengers.
Teacher: What are passengers?
Children: People.
Teacher: People who what . . .?
Child: Go onna plane.

While viewing a movie taken at the same trip:

Child: The people are waiting to go on the airplane.
Child: I see the passengers.
Child: Passengers going into the airplane.

Passengers were also perceived by themselves, by ticket clerks, and by flight personnel as people who have suitcases or baggage and, gradually, as requiring tickets before boarding the plane. They saw themselves on the receiving end of service by the stewardess, particularly in the matter of food. By the time Spring had come, children also secured money from the teacher, and eventually from the "bank" to pay for their tickets. For, as one child said, "She's a passenger. She's putting clothes in the suitcase. They're going on the airplane. If you don't get tickets, you can't take a ride." This statement sums up understandings of sub-concepts related to passengers in air transport which had developed through play, discussion, and structured experiences.

Purposes of Air Transport

For the most part, little attention was paid to the reasons why people move from one place to another by air. It seems that the pleasure of going somewhere seemed reason enough for the children. However, the teacher utilized several situations which arose naturally in the children's lives to identify several reasons for passenger use of air transport. Just before the first class trip to the airport, the teacher mentioned that the airport was likely to be crowded because many people go to visit relatives during Thanksgiving. When one of the Puerto Rican boys returned from visiting his relatives in Puerto Rico, although he had a very meager English vocabulary, he was able to express himself with the help of the teacher, as follows:

Teacher: Where is Bud? I want to talk to you. Where did you go last week?
Bud: Puerto Rico.
Teacher: When?
Bud: Last week.

Teacher: How did you go?
Bud: (Gestures, speaks in English which cannot be understood, interspersed with some Spanish.)
Teacher: What do you call it?
Bud: Plane.
Teacher: Who went?
Bud: My mother, sister, not my father.
Teacher: Not your father?
Bud: No, he stay in my house.
Teacher: What did you need to go on an airplane? Did you have a ticket?
Bud: No.
Teacher: Did you mother have a ticket?
Bud: No, a pasaje.
Teacher: Is that a ticket?
Child: A paper.
Teacher: Well, it was a very nice story. Bud told us about an airplane. He really went to Puerto Rico for a vacation.

At other times, the teacher referred to a vacation trip which her own parents were taking at the time. She told the children that since her parents were going very far away for a vacation, they decided to go by airplane so that it would not take them so long. She also talked about trips which she had taken during summer vacations on an airplane to places far away, such as Mexico and Spain.

Toward the end of the school year, a visitor from Malaysia spent several days with the children. On her last day at the school, she brought a tape on which she wished to record some songs by the children for use with children who she would be teaching in Malaysia. In her discussion, she told the children that she had very, very far to go to get to the country where she lived and worked and that she was in a hurry to get there, therefore she was going by airplane.

After the second airport trip, when baggage handling had received considerable attention, the teacher helped the children recall the conveyor belt they had seen in operation and children remembered that crates moving on the belt into the airplane held, "Food for Puerto Rico. Suitcases. Clothes." In general, the purposes of air transport figured rather

peripherally in the children's self-structured activities, and boys often played they were piloting army bombers or space ships. The discussions which the teacher structured accounted for the only evidence of building a base for sub-concepts related to the purposes of transportation.

Interdependence of People

The sub-concepts relating to the interdependence of people may be seen as the corollary to the sub-concepts of specialization. The emerging patterns of play and discussions as reported in the previous section grew from uninformed, undifferentiated role assumptions to more complex and more realistic ones. Through this development, the inter-relationships of the various roles were underscored and played.

In the beginning, uniformed pilots and stewardesses and potential passengers all worked together to build the plane, "fixed" it when necessary, carried out refueling activity, and served food indiscriminately. However, as the play became more differentiated and more closely related to reality, it assumed patterns of interdependence. After plane structures were made, children most interested in pursuing the idea of going somewhere or driving the plane frequently, by act and word, made clear that stewardesses were needed, that passengers were welcome, and that the ticket clerks were required to sell tickets to passengers before they could board.

During one breakdown of the plane, when the pilot was willing to lend a hand in fixing the "motor," one of the children said, authoritatively, "No, pilot's no fix planes. Him, him's job," while pointing to the boy dressed in the mechanic's jumpsuit who was wielding a screwdriver and pliers, "You gotta wait till he fix da plane; den you can go." Another revealing comment was made as follows: "Here, S..., here's the captain's hat. You be the captain. We're all ready to go to Puerto Rico but we don't got a captain." Similarly, the reliance of both passengers and crew members on stewardesses for food was a recurring theme in air transport play.

There was no need to distinguish between children's growth in moving toward building a base for sub-concepts of interdependence of people in air transport and toward beginnings of sub-concepts of job specialization, since these were not verbalized other than in very specific contexts. Obviously, deepening awareness of the one set of ideas necessarily contributed understanding to the other set. As the children continued to develop and shape these ideas, they should be building a solid base for eventual generalization and verbalization.

Cultural Pluralism

The learning goals for beginning aspects of the concept of cultural pluralism were conceived in terms that focussed on the major topic of air transport, but also extended beyond into other class activities and interests. However, a natural and functionally related facet of air transport discussion and play was evidenced in frequent references to the destination of the plane during play.

Because over half of the class were Spanish-speaking and most of these had cultural ties to Puerto Rico, their airplane play trips went to Puerto Rico more than to any other place. It was the teacher, however, who first introduced the possibility and acceptability of Puerto Rico as a destination. Not until three weeks later was there any observational record that children said they wanted to go to Puerto Rico or that the plane was going there. This is not to say that no such references were made, but it is significant to note that after this first record, Puerto Rico or foreign countries such as Mexico and China were named in almost each succeeding week's records during which air transport play occurred in the classroom. While the purpose of suggesting many foreign terminals for air trips was related to the sub-concept that air travel promotes understanding between peoples, this was not explicitly verbalized.

Language

Cultural pluralism as a value in our society, when translated into the kindergarten curriculum, was also expressed as an interest in and respect not only for English but also for

languages other than English. There were discussions in which knowledgeable children shared their Spanish vocabulary with non-Spanish speaking children to help interpret songs which used both Spanish and English words such as "The Spanish and English Song" about animals. During a trip to the airport, attention was called to announcements of departures in Spanish and English with the explanation that, in this way, people who spoke Spanish could understand when their plane was ready to go. Signs, printed in Spanish and English, to designate the "in" and "out" traffic flow at the lunch counter, were also pointed out to the children. Some time later, when slides of the trip were shown, children explained that the signs "tell to go 'in' and 'out' if you want to eat - in Spanish and English."

Children were encouraged to learn a few words in other languages as taught by other children in the group. The teacher, who was genuinely interested in learning them also, influenced the group positively in this regard. The following occurred in a discussion following the playing of a record which a child brought in:

Child: Where does this music come from?
Teacher: Where do you think?
Child: It's Canada.
Child: It's Greece.
Child: It's Spanish.
Teacher: Does it sound like Spanish music? This music is from Greece. All the words are Greek. And it says the name of the song on the record in Greek. Can S.... (who is Greek) say a Greek word? Can you say "Hello" in Greek?
S....: (says it)
Teacher: Everybody try it.
Children: (try)
Teacher: And how do you say "Goodbye?"
S....: Goodbye.
Teacher: No, that's English. How do you say it in Spanish?
Child: Hasta luego.
Child: Adios.
Teacher: And how do you say it in Greek?
S....: (says it in Greek)
Teacher: And how do you say "Hello?"

S....: (says it)
 Teacher: And how do you say "Hello" in Spanish?
 Child: Como esta!
 Teacher: W.... (English speaking), how do you say it in Spanish?
 W....: Como esta.

The teacher capitalized further on children's increasing willingness to share their Spanish vocabulary, through her choice of storybooks to read to the class. One day, reading a book with many Spanish words, the teacher led a discussion, as follows:

Teacher: Marina, what language did he speak?
 Carlos?
 Carlos: Spanish.
 Teacher: This story has a lot of Spanish words and a lot of English words. How do you say dog in Spanish?
 Many children: Perro.
 Teacher: How do you say pussy cat?
 Child: Patito.
 Teacher: What color was the dog?
 Child: Red.
 Teacher: How do you say red in Spanish?
 Child: Rojo.

From time to time, simple greetings were given in Spanish, and routines such as announcements of play time or juicetime incorporated use of Spanish in an incidental and effective way.

Air Travel and Cultural Contacts

Some of the props for air transport play were useful in increasing children's awareness of the idea that people from other countries come here, frequently by airplane. When the globe was first placed in the play area, children were very attracted to it, examined it, whirled it around,

and named many of the places they could think of. Although the pilots managed to establish the strongest claim on its use, many of the children played with it. Subsequently, the teacher structured a discussion which centered around the globe as a symbol of places where people live.

Teacher: Can I have the globe?
 Child: What's the globe?
 (Another child brings the globe to the teacher.)
 Teacher: What do you think I'm looking for?
 Child: Israel?
 Child: Puerto Rico?
 Child: Mexico?
 Child: Greece?
 Child: Miami?
 Teacher: First I have to find where we are.
 Child: America! (He puts his finger on U.S. on globe.) (It was accidental; he could not repeat it.)
 Teacher: This is America, where we are. Let's see where Greece is. Here it is. (Teacher marks each with a small piece of colored felt.)
 Child: How far it is!
 Teacher: And over here is . . .
 Child: Puerto Rico.
 Child: Cuba.
 Teacher: I'll show you. Here's Cuba. That's where Alfredo comes from. His mommy and daddy were born in Cuba. Were you born there, too, Alfredo?
 Alfredo: Yes.
 Teacher: So here's where Alfredo was born. (Fixes felt marker on Cuba.) (pointing to tab marking Greece) And this is where Stewart's mommy and daddy were born - in Greece.

The globe also featured prominently in establishing how far away one of the research assistants was going in her return to Malaysia, where the children spoke Chinese. The children were quick to make the association with some children in the school who were of Chinese parentage and spoke Chinese.

The children also responded with interest and involvement in several incidental discussions involving trips to and from various countries on the part of visitors to their classroom. Occasional references in their play to Israel probably stemmed from their contact with another research assistant who was returning to her home in Israel and with the teacher's mother who was, at the time, vacationing there. The teacher sometimes referred to her visit the previous summer to Spain where people spoke Spanish. The Spanish-speaking children were quite free in speaking Spanish to visitors from Peru with whom they communicated effectively.

Understanding of Cultural Contributions

Recognition of Puerto Rico Day on November 19 was the occasion which served to highlight a sense of appreciation of Puerto Ricans in the community through simple activities that would be of interest to the kindergarten children. In preparation, the children reviewed some of the Spanish folk songs which they had previously learned. Plans were made for the mother of one of the Puerto Rican children to help the class prepare fried plantain snacks. Several children were to go shopping for bread and jelly at a nearby Spanish grocery or bodega. The morning was to end with a party in which the food prepared by the children would be eaten, followed by singing and dancing of Spanish and Puerto Rican folk songs and dances.

The children's excitement and keen involvement in the special activities for Puerto Rico Day was laced through with experiences of discovery by some children and feelings of pride by others. A few brief excerpts from the observation notes of that day follow:

Teacher: Today is . . .
Child: Puerto Rico Day.
Teacher: We're going to do something special in school today so we can learn a little bit more about the people in Puerto Rico.... We know the people there speak Spanish. We know you go there by . . .
Child: Airplane.

Teacher:We're going to eat something this morning that people eat in Puerto Rico. . .

 Child: Bread.

 Teacher: Yes, one thing we're going to eat is bread.

 Teacher: What is it called?

 Children: Majorca.

 Teacher: How many children eat majorca bread at home? (Six children raise their hands.)

 Child: It's round.

 Teacher: We're also going to eat something else Puerto Rican people eat. (Holds up plantains.)

 Teacher: What is it?

 Children: (several) Aquineo.

 Child: Platano.

Discussion followed drawing comparsions between plantains and bananas. It is interesting to note that children used both terms, "plantains" and "platanos" quite freely and that other Spanish words like "blanco" are freely interspersed with comparable English words.

When the children who had gone marketing returned, they reported:

Child: We went to the bakery.

 Teacher: Was it a special kind of bakery?

 Child: It was a different one.

 Teacher: What did we ask the man to give us?

 Child: Majorca.

 Teacher: ...This is Spanish bread and Spanish jelly.

 Teacher: It is called papaya.

 (The children were unusually vocal in describing how the unfamiliar foods tasted to them. They used such words as: delicious, like ice cream, good, sweet, like pound cake, like green soda, like cookies, like a banana, just like bread, like a peach, etc.)

 I know what this (majorca) tastes like. I eat it on a holiday. Spanish people have Spanish holidays and Jewish people have Jewish holidays. I eat something like this on Jewish holidays. It's called "challah."

 It's sweet - delicious.

The above discussion suggests the frequent class discussions which equated different cultural food tastes, while differentiating among them.

In the next newspaper which the children composed for their parents and which was translated into Spanish, their recall and enthusiasm for the events of Puerto Rico Day was extensive. They continued to request the Spanish songs, and their dancing in response to rhythmic Spanish recorded music was varied and expressive.

Throughout the year, the teacher introduced a variety of ethnic music, particularly that of the Middle East and Africa, for children's listening and dancing. Some children became more sensitive to distinctive qualities of music of different peoples.

Teacher: I'm going to play a record. When it's over I'll ask you what kind of music it is. (She plays African record with drums and chants.) (Children sit on floor, quietly responding to the rhythm with hands, legs, and bodies.)

Child: I think I know what it is. I think it's jungle.

Child: African.

(Teacher plays a Caribbean record.)
Teacher: Is this African?
Child: No. It's Spanish.

In response to the teacher's evident appreciation of music and dance of many cultures, children spontaneously brought in records representing music of their own ethnic background and sometimes announced that they would sing "a Spanish song" they learned at home. Some of these were included in the repertoire of the class and were shared with mothers at a Mother's Day party in the spring to the delight of the children and the expressed appreciation of the mothers and other visitors.

Analysis of Observational Data

An analysis of the data related to the social science aspects of the demonstration project indicates that the children made noticeable progress in developing the beginnings of sub-concepts regarding air transport for the three concepts selected for study. It is also evident that the more conventional teacher strategies of reading books, leading discussions, and providing play materials were insufficient to help children achieve increased vocabulary, correction of misconceptions, or more precise understanding of the social sphere which they were dramatizing. On the other hand, with guidelines provided by the pre-selected learning goals which were formulated on the bases of key social science concepts, the teacher was able to develop a program through which children gradually moved toward these goals.

During the early weeks of the study, interest and participation in airplane play was noticed among a number of children. But the play was marked by a paucity of ideas, undefined roles, lack of information and misconceptions about air transport and its personnel, as well as by extremely sparse vocabulary which hampered conceptual growth.

As the teacher, guided by the pre-selected goals, devised materials, selected activities, structured discussions and events intended to help children develop sub-concepts related to air transport, a dramatic, though fairly steady growth took place in the children. Air transport play grew in complexity; it became more closely related to reality in its details; it reflected children's expanding ideas about personnel and their functions; it mirrored a certain sequential logic which reflected some of the inter-relationships in air transport. There was, also, a marked expansion of vocabulary and more precise use of terminology both in guided discussions and independent play. These results point to children's growth in understanding that people in air transport have special jobs and that there are names to identify these jobs. In other words, they moved toward beginning to develop the concept of specialization as a characteristic of our society.

As air transport play became more complex and differentiated, the various roles and activities became dependent upon and interrelated with each other. The idea of interdependence became an implicit, and sometimes explicit, part of dramatic play. Children demanded that the plane be built before the crew could fly it. Flight personnel were no longer permitted to "fix" the plane when things went wrong or when it needed refueling; they had to depend on mechanics and ground crew. Passengers were required to purchase tickets from ticket clerks before boarding the plane, although ticket collection remained vague. Baggage was generally weighed, tagged, and handled by porters. Stewardesses consistently performed services, primarily related to food and safety, while carefully distinguishing themselves from passengers. In other words, as children demonstrated an increasing awareness of specialization, they also reflected an implicit awareness of its corollary - interdependence - as a characteristic of our society as translated into kindergarten terms through the topic of air transport.

It was hypothesized, also, that children can be helped to develop efficient learning strategies utilizing various forms of symbolic representation. Most of the data and analysis relating to symbols are placed in Chapters V and VI. It is, however, relevant at this point to refer to the advancement made by children in utilizing symbols directly connected with the social science phase of the study.

Labels, introduced by the teacher to help identify uniforms and work areas such as those of the ticket clerk, were eventually "read" by children and used as clues for correct selection of items. Random marks on "tickets" gradually were replaced by correctly copied or independently written children's names and numerals. Maps and a globe became an important part of air transport play, to identify countries and cities as the destination of a particular flight, and to help the pilots find their way. But, as might be predicted, the interest and pride in recognition and production of the written symbol of one's name captured the children's interest particularly, so that much more attention to names was apparent in other activities than those related, primarily, to social science.

The learning goals related to the concept of cultural pluralism as a value in our society were defined, in part, as relating to the topic of air transport and, in part, as relating to other facets of the curriculum such as music, dance, and language arts. But the most subtle, yet most significant goal, was to help children overcome, to some extent, a sense of inferiority because of their social or ethnic or racial group identity by creating an atmosphere of interest in, acceptance of, and appreciation of various cultural heritages.

Although there was no quantitative record of the frequency of Spanish spoken by the children at the beginning and the end of the study, several reports by the researchers and the teacher called attention to an interesting development. In each case it was reported that, during the latter half of the study, children seemed to be more relaxed and uninhibited in their use of Spanish in the classroom and in their readiness to help the teacher translate English words into Spanish. This was contrary to the earlier behavior of the Spanish-speaking children who seemed to be very reluctant to admit that they knew Spanish words when the teacher asked for similar help in translation. One such incident occurred early in the year when the teacher asked for help with the Spanish words of "Cielito Lindo," a favorite song of the class. The Spanish-speaking children disclaimed knowledge of the words even though the teacher had reason to believe they knew them. Later in the year, when the teacher, again, forgot some of the Spanish words of that folk song, one of the children supplied them eagerly and several of the children sang them in Spanish quite freely.

Note was also taken of the marked increase of English spoken by Spanish-speaking children in their play with each other, with an occasional Spanish word used in an English sentence. Since the increase in Spanish and English verbalization appeared to occur concomitantly, it may indicate that young children can be encouraged to improve their English skills without inhibiting the language they already have. The apparent value to be derived from their feeling of acceptance of their language and, thereby themselves, is significant, indeed.

Children's growing awareness and interest in various countries as destinations of air travel was also enhanced by skillful use of resource persons who helped them personalize travel to and from other countries. They gained some appreciation of the value of bilingualism in communicating with people who travel by planes, as seen in their recall of Spanish and English signs and verbal announcements at the airport and their function.

The children not only developed a sizable repertoire of folk songs of different ethnic groups, they also showed growth in auditory discrimination and some skill in identifying the countries of origin of music to which they danced. They felt free to bring in records and share songs which stemmed from their particular cultural heritage. In summary, children appeared to feel more comfortable with their own ethnic identity in the classroom and participated with interest and enthusiasm in sharing some of the cultural contributions of others.

Although an analysis of data shows evidence of children's growth in developing learning strategies through utilizing the beginnings of key concepts in social studies, the data do not permit an evaluation of the growth of individual children. Since there were no individual protocols in the recorded observations, and since many of the tape-recorded observations of group discussions and play make it impossible to identify which children made which comments, it is impossible to measure individual progress. The available records do, however, indicate that some children were more deeply involved more of the time than others in structured experiences, discussions, role playing, and dramatic play related to the central social studies topic of the study. It would be valuable, in another study of this type, to plan ways of acquiring sufficient data to present profiles of individual children within the group.

CHAPTER V

Mathematics Concepts

Learning goals in mathematics, as in social science, were stated to include some initial understandings of selected key concepts as well as the development of efficient learning strategies. The content of mathematics was regarded as an essential base, among others, for concept building, for learning skills of symbolic representation and, ultimately, for contributing in a fundamental way to increased potential for subsequent academic success. The demonstration study, therefore, was concerned not only to help children advance in initial mathematics learning but also to help children acquire and use more productive learning techniques.

Pilot Study - Spring 1964

A list of twelve mathematics concepts was selected as learning goals for the exploratory study in the Spring of 1964, as shown in Figure 1, ranging from perception and naming of sets, one-to-one correspondence, to decimal base, measurement and concepts of zero. While this was an ambitious list for five-month kindergarten study with a classroom teacher who found the proposal stimulating but confusing and difficult to understand, it seemed worthwhile to evaluate the goals by testing their relevance to the children's needs and abilities.

Figure 1

1. Sets as collections of objects.
Perception of sets and naming of sets.
Identifying members of sets and distinguishing between sets.
Comparing and contrasting sets for more and fewer elements.
Conservation of sets.

2. One-to-one correspondence.
Mapping elements of one set to another.
Determining equivalence of sets by mapping.
Comparing sets.
Reproducing sets.
3. Union, separation and intersection of sets.
Combination of sets to form new sets. Disjoint sets.
Recognition and identification of subsets of sets.
Separation of sets into subsets.
Intersection of sets for common elements.
4. Cardinal number as characteristic of sets and numerals as number names.
Rational counting of sets yields cardinal number and numerals represent that number.
Invention of numerals and rational counting with invented numerals.
5. Ordinal number, ordering numbers and numerals.
Order and meaning of ordinal numbers and their relationship to each other.
6. Decimal base. Grouping in subsets of tens in rational counting. Counting in tens and subsets of tens.
7. Zero as the empty set.
Zero to represent a set previously in existence but now empty.
Zero to represent a set now empty but capable of coming into being.
Zero to represent a set which has no real existence.
8. Names of geometric shapes as: square, rectangle, triangle, circle. Recognition and identification of shapes and reconstruction of shapes with objects.
9. Measurement.
Linear measurement with non-standard units as one's own hand or foot as a length of string, focusing on points, line segments and lines. Finding equivalent length, matching and reproducing linear measurements.
10. Quantitative terms as: more or less, greater or fewer, longer or shorter, thicker or thinner, faster or slower; spacial terms as: up and down, inside and outside, top and bottom, etc.

11. Integrating some mathematics concepts with geographic concepts as in: direction, distance, measurement.
12. Integrating some money concepts with mathematics concepts as in: decimal base and grouping by tens and money values and equivalence.

Level of Children's Mathematics Concepts

It is often assumed that disadvantaged young children have more advanced concepts than middle-class children about money, coins and equivalences, because they may be sent to stores to make small purchases, unlike middle-class children whose parents do not expect this much independence. Coins are obviously good materials for learning quantitative concepts and children generally have early acquaintance with smaller coins. The researchers, therefore, developed a simple test with coins to gauge the level and content of the mathematics concepts of children in the class. Figure 2 represents the procedure for administering the money test.

Figure 2

Instructions for Administering Money Test of Identity and Equivalency

(Coin purse contains 13 pennies, 8 nickels, 4 dimes, 1 quarter, 1 dollar bill.)

Give child purse, tell him to empty it onto table.

1. Say: If you buy a bar of candy from me that costs a nickel or five cents, how would you pay me?
(Ask child to hand you the money.)
2. Say: What else is the same amount as a nickel or five cents?
(Ask child to hand you the money.)
3. Say: If you buy pop corn from me that costs a dime or ten cents, how would you pay me?
(Ask child to hand you the money.)
4. Say: What else is the same amount as a dime or ten cents?
(Ask child to hand you the money.)

5. Say: If you buy a loaf of bread from me that costs a quarter or twenty-five cents, how would you pay me?
(Ask child to hand you the money.)
6. Say: What else is the same amount as a quarter or twenty-five cents?
(Ask child to hand you the money.)
7. Show child the penny, nickel, dime, quarter, dollar.
Say: Which is the most money? Give it to me.
8. Say: If you gave me a dollar to pay for the nickel candy, what would happen?
(Record verbatim response.)

From the responses to the money test, it quickly became apparent that these children lacked the names for most coins and the dollar bill and had no conception of a nickel as a "five-cent piece." Quantitative concepts were extremely primitive, even in the simplest counting operations. Since the money test was in the process of development during the pilot study, and since the wording was changed several times in an attempt to insure the children's understanding of the questions, it is not possible to present a quantitative summary of results.

Initiating the Program

The focus of content for the pilot study, "Providing for Family Food Needs," offered excellent opportunities for children to advance their beginning understandings of mathematics concepts. It will be recalled that the researchers assumed that young children's early learning experiences must be as concrete and action-oriented as possible, with considerable manipulation, exploration and play so that the child gradually internalizes and schematizes, progressing from physical objects and motor action to symbols, speech and verbal representation and abstraction. But it is suggested that, while unstructured play is basic, it is not sufficient to insure desirable progress for the deprived child.

The program was initiated, about the third week in March, when, following some class shopping trips, the teacher set up a store play area as a distinct center of interest. During the free play or work period, children could choose dramatic play in this area or any other activities generally available to them and they could move freely from one to another as they chose.

Providing Materials for Learning

The teacher sought the parents' cooperation to collect a variety of materials that could be used in store play. There was soon an abundance of empty food cartons and cans, plastic bottles, double-handled marketing bags, shopping carts, and other novel play props. Children's interest in bringing objects from home for store play continued for several months and contributed to maintaining sustained involvement in developing the play.

During the early stage of store play, children tended to flow from the housekeeping or block area into the store play area and back, with much physical movement, frequent exchange of roles and intermittent play. On April 13, the teacher reported that store play continued to consist chiefly of taking all the empty food containers out of the store area into the housekeeping area in play that was primarily manipulative. On this day, however, Ellen said she needed money for the store and the teacher offered her some metal discs which were handed back and forth by the children as "money."

Structuring Elements in the Program

While the unstructured experiences helped the child to involve himself in significant learning, it was thought that structured experiences were required for substantial progress. Plans were made with the intention of helping children to stabilize some of the learnings they were acquiring incidentally, accidentally and partially, as well as for the purpose of extending their base for gaining information and understandings. Taking a cue from children's new interest in "money," it was decided to introduce play money to them, to take them on real buying trips to supermarkets, and to begin to hold directed discussions with the class to focus on the contrast between their play dramatization and the reality they experienced on shopping trips.

Structuring Discussions: Number and Money Concepts in Store Play

The next day, after the free play period, the teacher read a story to the class involving ten cents change. The teacher asked, "What is change?" The chorused replies were, "Money." When the teacher asked, "Where do you get change?" Charlotte said, "You go to work and make money." Other children replied that the storekeeper gives you change.

"Why does he give you change?" asked Miss J.

"'Cause you give him money," said Jay.

"Does he give you money all the time?" asked Miss J.

"No," replied Jay, adding, "he doesn't have any more money 'cause you give him money."

Lisa said, "If you give him a dime, he keeps it, but if you give him two dollars, he gives you change."

Fred's contribution was, "He gives you money because he cheats you."

The teacher announced that she was assigning homework: to go to the store with Mommy, to find out why the storekeeper gives Mommy change. The results of this assignment were recorded the following day, as follows:

"Because you have too much money," Charlotte said.

"Every day, when you buy something, he always gives you money. He's supposed to give you money. He always gives you money back," said Ted.

"When he gives you money back, you can get plaid stamps," was Sylvia's report.

"'Cause he has too much money," Manuel said.

However, Victor reported, "When the food is a half dollar and you got a whole dollar, he gives you change," indicating that he, at least, had retained or understood the nature of the change-making transaction, admittedly a complex focus for initial number concepts.

Store play reflected some gross ideas about change the next day, with much interchange of play coins accompanying the buying and selling. Prices were quoted by storekeepers from fifty cents for a can of coffee to ten cents for a bottle of "Mr. Clean" and a dime for a dozen eggs. However, generally it was noted that when there was any money transaction, storekeepers paid customers, who usually left the store with more coins than they had brought, as well as arm-fulls of empty food cartons.

Creative Dramatics: Money in Store Play. In addition to discussions, the teacher structured dramatizations by several pairs of customers and storekeepers to help children become conscious of their buying and selling play and the place of money in comparable real life situations.

Several instances of this type of role playing were recorded as follows:

Miss J. selected two children to dramatize, for the class, the buying-selling transaction and the use of money. Barbara chose to be a customer and Charlotte agreed to play the storekeeper. They were given no instructions other than to show the class how to play customer and storekeeper.

Barbara stood in front of Charlotte's small table-counter and ordered a box of "kelloggs." Charlotte handed her a box, paid her some play money and gave her change. Barbara promptly objected to this action and requested some money so that she could pay for her purchase. Miss J. interrupted to emphasize the point that food is not free and that you cannot go marketing without money. She asked several children to respond to the same question, "What do you need before you go shopping?" and each child replied, "Money." Miss J. concluded, "Food costs money."

Next, Linda and George were asked to create another buying-selling scene, and Linda asked to be storekeeper. The teacher asked the class whether George was ready to play customer. Barbara said, "No," and Marconi added that George needed to get some money first. Miss J. asked whether Linda needed any money and, again, many children said she needed money "to pay customers." The teacher suggested the children find out, next time they go marketing, whether the storekeeper always gives the customer money.

After George ordered his groceries, he offered money to Linda. Miss J. asked George how he knew how much to pay and he said the customer tells the storekeeper how much the food costs. He handed Linda some play money coins and she returned several to him. Again, Miss J. pointed out the children could find out next time they went marketing how the customer knows how much to pay.

While some of the confusion about money, change and paying for purchases, evidenced above, may have been more verbal than real, a considerable area of real confusion and lack of information was mapped.

Direct Experience: Shopping Trips. Information gathered from observing children's store play, from discussions, and from role playing pointed up the need for planned direct experiences to help children gain clearer ideas about money and marketing. To further this goal, the following questions were identified as productive ones to direct and focus children's observations and perceptions on subsequent trips to stores:

1. Is there a price on every kind of food? Where is it?
2. Does the storekeeper have to have money? Does he "pay" the customer?
3. Do all the store workers do the same things? What jobs do they do?
4. How does the customer know how much to pay?

On April 27, one researcher took eight children marketing, each one purchasing, with real money, an item requested by his mother. On their return to school, a tape recording was made of their report on their marketing trip to the rest of the class. It was clear that these children noticed the prices stamped on food items, but they identified the checker as, "the man who gives the money back."

When the children went to buy Italian bread on May 7, the teacher emphasized payment and change-making among the other questions which guided the trips. She asked the children to note she was tendering a dollar bill in payment for bread that cost sixty-eight cents, asking whether she should receive change. Some children thought she should, others did not think so. When she received her change, she showed it to all the children to emphasize that she had not offered the exact amount and therefore required change. When the class trooped next door to buy jelly and peanut butter, and the teacher offered the checker a dollar bill, the children were more positive that she should receive change. For most of the children, this might have indicated thoughtless repetition, without clear understanding, but Peter said, "because she gave him too much money."

Providing Opportunities for Children to Use Symbols

Numerals. Other aspects of store play offered many opportunities for the children to begin developing concepts of number and numerals as number names. Capitalizing on children's expressed need for "money" in store play, the teacher furnished cardboard discs on which she encouraged some children to write numerals, to simulate coins. Then, when a small price-stamping machine was introduced, it was used chiefly in manipulative play, but so enthusiastically and vigorously that it was shortly out of order for several weeks. Cash register tapes brought back from various shopping trips were also saved and used actively in store play until they became too torn or crumpled. Thus store play invited considerable use of numerals and prices in dialogue and signs and written on play money, for which the teacher-made chart of numerals was a handy reference. Prices printed by the price-stamping machine and other incidental use of numerals provided for frequent visual contact with numerals for identification and for use in conversation and play.

Coins. Further focus on numerals and coins was initiated on May 14. The teacher announced, before store play began, that any child who expected to be a customer would come to her, as to a bank, to request a specific number of specified coins. The teacher tested several children's ability to grasp the quantities involved by giving them incorrect quantities, but the children quickly corrected her. In this situation the teacher provided regular practice in coin recognition, counting and meaningful use of number. The money play, however, continued to contain more stealing and hiding than mathematics content, but it was not planned to discourage this, since the play was actually promoting considerable coin manipulation, observation and identification by color, numerals and inscriptions. Although the children sounded very knowledgeable as they used the play coins, the superficial character of their knowledge was easily established when one of the researchers questioned them about these coins and they showed some confusion and made frequent errors of identification.

Soon the teacher turned the banking function over to selected children daily as another way to encourage children to practice their counting and naming skills, spontaneously, with each other.

Guiding Practice Activities

To help children further clarify their concepts of money uses and work on one-to-one correspondence, the teacher structured a daily practice situation which involved all the children in a buying-selling situation. The daily cookie and milk routine provided a natural opportunity for this repetitive practice. Cookies were "sold" for play money. The teacher would announce the price, post a sign to associate the numeral with the number, appoint a cashier to distribute the correct amount of play money to each child to cover the cookie cost, and a storekeeper was selected to "sell" the cookies.

For several days, cookies had sold at one penny. On April 30, the group was permitted to vote on the cookie price, which they set at two cents. The children "read" the sign which the teacher made, using numeral and money symbol, "cookies - 2¢." One of the researchers sat beside Rudolfo, the storekeeper for the day, and, as each child tendered his two pennies, she asked if he expected any change and why. Only Carlos replied in the affirmative, but he dashed away without saying why. Children who indicated why they did not expect change gave such responses as:

- "Because you have two pennies."
- "I only got two pennies."
- "Cookies cost two cents."
- "Cause you give him two cents."
- "I only gave him two cents."
- "I got a cookie."

While no child explicitly stated that no change was needed because he was tendering the exact amount of the price, most of the children seemed to understand this. The teacher, at this time, posed a quantitative and ethical problem by buying a cookie with only one penny. The children noted this but made no comment. She pointedly remarked that she gave Rudolfo only one penny and asked whether he should give her a cookie. One child responded that Miss J. should have received two cookies. But the other children were divided on whether the teacher should have a two-cent cookie for only one cent.

One child said, "You have to have two pennies." Sara said, "I'm the court manager. It doesn't matter." Miss J. said, "I'm afraid I can't buy it. I don't think the storekeeper can sell it to me. I gave him only one penny and cookies cost two pennies. I can't buy any today."

One child said, "I'll make a penny for you."

Another said, "Sneak it, Miss J."

"I'd never do a thing like that!" Miss J. replied firmly.

"My brother does," one child volunteered.

"He'll go to jail," was the judgment of another child. "Does your Mommy know?" Miss J. asked. "That's dishonest. You must never, never take anything or steal anything from any place."

"You might go to court," a child noted.

"You might go to hell," another child suggested.

One child quickly stated, "We don't want Miss J. to go to court."

Miss J. said, "Grown-ups don't do things like that. Sometimes children do because they don't know any better."

While the ethical problem may not have been finally resolved, the point was driven home that a two-cent cookie could not be purchased for one penny.

Summary of Pilot Study Work in Mathematics

Most of the work in developing mathematics understanding in the pilot study was developed in the context of store play, that is, chiefly through social experiences. The play money, the cash register, the price-stamper and the bank station all constituted teacher efforts to introduce content, information and greater necessity for experiences and practice with numbers, numerals, one-to-one correspondence, counting and grouping.

The strengths of the teaching strategies developed were as follows:

1. Children's ready acceptance of the materials and play content introduced. No extensive "motivation" was required. Despite the considerable complexity of the material, the children found enough familiar cues to respond actively to most of the stimuli and to enjoy the challenges and problems put to them.

2. Children had considerable free choice in their use of the materials and content, and imaginative, playful activities were given free rein in most of the classroom experiences described.
3. Interest remained high in the materials and content over a period of four months, adding further evidence of children's ability to pursue topics and interests over long periods.
4. Many of the children involved themselves in play from which to build mathematics concepts, but all the children were engaged in several structured activities which tended to extend learning opportunities to all, or at least, most of the children in the class.
5. The teacher was able to accept the researchers' suggestions for classroom experiences and teaching strategies because they did not conflict with her own perceptions of good kindergarten teaching.

The weaknesses of the teaching strategies were seen primarily as:

1. Insufficient practice opportunities for all children to make needed progress in mathematics understandings. Structured situations seemed too few for potential progress to be realized.
2. Lack of recorded data as to individual children's mathematics understandings and subsequent progress, with consequent difficulty in planning for specific children's progress.
3. Insufficient time by the teacher spent in individualized work with specific children to further their learning potential.

Demonstration Project - 1964-65

The list of understandings in mathematics developed for the pilot study as listed in Figure 1 of this chapter was retained as the basis of selecting learning goals for the

demonstration project. Although these mathematics concepts are seen as goals for several grade levels, including the kindergarten, it was thought useful to spell them out rather fully as a challenge to the teacher, as well as to the researchers, to work for a broad range of achievement. This wide range of learning goals alerts the kindergarten teacher to the direction and scope of present and subsequent learnings and the need to refrain from regarding very limited goals as satisfactory for deprived children.

Teaching Strategies for Mathematics Concepts

In September, before the demonstration project began, the researchers supplied the teacher with a list, as reproduced in Figure 3, of some of the mathematics experiences she could select for each mathematics learning goal. Additional suggestions for program development, trips and work with symbols were elaborated in early planning sessions with the teacher.

Providing Materials for Learning

Providing materials for incidental learning is a productive teaching strategy for young children because it offers many opportunities to practice application of learnings in new and unexpected contexts, it utilizes motivational factors that are already high, and it capitalizes on the obvious utility and significance of the learning. Understandings concerning one-to-one correspondence, grouping, counting and identification of sets were approached in many situations in which the mathematics learning was incidental.

Organizing For Play. On November 9, when the teacher read Pogo's Jet Ride to the whole class and, discussing some of the pictures, asked, "How many people fly a plane?" Sam said, "Two." From the context of this discussions, it was clear that he meant the pilot and the co-pilot.

On March 8, the children were singing a song about flying in an airplane. Some children pretended to be carrying heavy suitcases and the teacher remarked:

Figure 3

Mathematics Experiences

- 1 & 3. Sets and union, separation and intersection of sets.
Sets of passengers, chairs, tickets, crew, food transported, milk, cookies, scissors, crayons, books, etc.
2. One-to-one correspondence.
Children (passengers) to seats in plane.
Children to reservation chart of plane seat numbers.
Children to tickets.
Food items to trays, trays to passengers.
Children to name roster.
Milk to children.
4. Cardinal number and numerals.
Counting objects as sets, tickets, blocks, cubes, straws.
Flannel board numbers, chalkboard number, ticket numbers.
Price marker to stamp prices on ticket.
Money transactions.
Counting for cooking and serving activities.
5. Ordinal number.
Ticket numbers, clock and plane seat numbers, baggage weight, children's turns, children's number on name roster.
6. Decimal base.
Money, Counting objects.
7. Zero.
Empty plane seats, absence of absentees.
8. Geometric Shapes and Names.
Blocks, use of arbitrary symbols and flannel board figures.
9. Measurement.
Cooking, weighing baggage, time, segmenting plane areas, carpentry, sewing or stapling.
10. Quantitative terms.
Dramatic and manipulative play with project materials.
Directed play.
Discussions.
11. Integration - Mathematic and geographic concepts.
Maps and globes. Dramatic Play.
Mapping and measuring space, as with string.
12. Integration - Mathematic and money concepts.
Money transactions.

"Joan had so many suitcases. How many did you have?" "Five" Joan replied, but other children called out, "Ten" and "Eleven."

Pedro said, "One thousand and one."

Other children added, "I had a thousand," "I had two thousand and one," "I had sixteen," and "Fifty whole baggage."

One day, as Enrico was browsing in a book, he showed the researcher the inside cover, saying there were two mailmen in the picture. The researcher suggested counting them and, together, they counted six. "How many mailmen?" asked the researcher. "Five, six," Enrico repeated. Then Enrico turned the page and observed correctly, "Here there's only one mailman," turned another page and said, "Here there are two mailmen."

Counting Spilled Nails. As the children helped clean up the carpentry table after a morning of sawing and hammering, making small planes, a can of nails was accidentally spilled on the floor. Three boys were given magnets to pick up the nails, by ones, twos, threes, and then fours, counting aloud each time.

Grouping During Woodworking. When a need arose to have a dolly on wheels to move a heavy airplane instrument panel around the room, it was decided to make one in class, combining woodworking with mathematics learning focusing on "four." The dolly needed four casters in four corners. Emphasis was on grouping by ones and twos, matching nails to holes in casters, two screws and two nails to one caster. When the nails were in, the children were asked how many more were needed. Ginny could tell how many more were needed, but she could not recognize groups larger than two. Here, again, practical application and practice of number learnings were pursued where their significance was obvious.

Counting During Cooking. Food was the main feature on Puerto Rico Day, but, as the children worked in groups to fry plantain chips in electric frying pans in class, a discussion was recorded in one group as follows:

"Are there a lot here? Will there be enough for everyone?" the researcher asked.

"No," replied a child.

"Well, how many do we have? Let's count."

One child counted the other children, then Manuel was asked to count again, to check the sum. Manuel counted to nine, but, when he was reminded that he forgot himself, he counted correctly to ten.

"Let's count pieces in the pan as I put my fork in," the researcher said. When the group had counted to ten, she asked, "Do we have enough? Will each child get a bite? Let's count again to see if we have more."

Again the group counted to ten and the researcher asked, "Is that enough?"

"Yes," one child said.

"How many will each person get?" asked the researcher.

"Four," another child said.

The researcher asked the group to count again and then she asked, "Can everybody have more than one piece?" One child replied in the affirmative, adding, "'Cause they're little."

"Why else?" asked the researcher.

"'Cause seeds are black and oil is bubbling," another child suggested.

"Do we have more children or more pieces of plantain?" asked the researcher.

"More pieces," said a child.

"How many think you have more pieces?" Apparently they all did. "Can you have more than one piece?"

"Yup," said a child.

After the plantain chips were cooked and put on a tray, the researcher asked three children to count them, to see if there were enough for each child and they reported that there were enough for a second round.

Using Numbers and Numerals in Airplane Play. One-to-one correspondence was often pursued in connection with passenger tickets. The teacher would remind the children at play that passengers could not enter the "airplane" (block construction) without tickets, saying, "No ticket, no ride." Would-be passengers without tickets would be directed to get tickets before boarding.

In response to the teacher's frequent suggestions that tickets needed names and numbers, "ticket clerks" worked at length at writing. When Stewart played ticket clerk on February 11, the researcher requested a ticket. Stewart asked her to write her own name but he added the numerals "10." When asked what he wrote, he quickly replied, "Ten."

Felt wrist watches, on which the teacher wrote numerals, furnished another prop to the pilots. On November 17, Sam kept looking at his felt watch, trying to identify the numerals as he said, "It's seven o'clock now; no, it's four o'clock now."

Numerical recognition and writing were pursued by quite a few children throughout the spring term, particularly when they chose to work as ticket clerks during play time. Some of the most work-oriented children selected this task and worked at it industriously.

Money Collection. Several times during the term, children were asked to bring small sums of money to cover some food purchases. On one occasion, when a buying trip was planned to a nearby supermarket, children were asked to bring a shopping list from home of one grocery item, with the amount of money required. Another time, when it was planned to bake cookies in the classroom, each child was asked to bring, "either five pennies or a nickel," to cover the cost of the ingredients. In this case, there was stress on the equivalence of a nickel and five pennies as well as on counting of coins.

Practice With Sets in Crayon Distribution. At the end of February, the teacher used the occasion for distributing new crayon sets as another practice opportunity to work on number concepts and color recognition. Each child had already been given a milk carton, decorated with green construction paper, as a crayon container, and each child had previously received one red crayon.

The teacher began by holding up a yellow crayon. She said, "I'm going to play a game. I'm going to let all the children that are wearing this color take one of these for your box. If you're wearing this color, come up and tell me what it is."

After distributing several crayons to children who came up and correctly identified yellow, green and orange crayons, matched to some item of their own dress, the teacher asked all the children to count the crayons in their own boxes. She took a small slate and made five distinct chalk tallies on it, then said, "If you have this many, stand up." Children who stood up were referred to the researcher, to check their count. The teacher then showed tallies of four, three and two. Stewart looked at the tally for two and said, "That's eleven." The teacher wrote the number two, identified it and added that the tally of two strokes was also two. When the teacher wrote a zero on the slate, none of the children recognized it and the teacher instantly realized her error. Since she was not writing numerals but strokes or tally marks, the proper representation for zero was a blank slate. As soon as the children saw the blank slate, they shouted, "None."

Then the teacher said, "You should have this many colors in your box. I'll show you." She taped objects which matched the crayon colors on the wall while the children chanted, "1,2,3,4,5,6,7." She led the children to identify each of the colors by name. Then, each child had to make a one-to-one correspondence between each crayon in his box and the objects taped on the wall, matching colors and numbers. There was intent counting and matching as each child tried to find out whether his box was complete, or, if not, which colors were lacking.

While this was an incidental mathematics lesson, it had all the advantages of a structured learning situation, with total-group involvement, in addition to the advantages of individual manipulation, reflection and application.

Incidental learnings seem insufficient by themselves. They help children elaborate and clarify much that might have been unclear, but children appear to require considerable support from planned learnings, of whatever degree of structure. The planned activities can furnish the specific goals and directions to be pursued incidentally whenever the teacher finds it possible to do so.

Structuring Mathematics Experiences

With specific learning goals for mathematics in mind, the teacher and the researchers selected various structured activities which could lead children toward further mathematics understanding.

Through Routines. Mid-morning snack-time continued to be a fruitful time for practicing counting, grouping, one-to-one correspondence and numeral recognition. A frequent exercise required one child to count the number of children at his table, including himself, to take his count to the child selected as cookie dispenser and to distribute the cookies at his own table. Sometimes a child forgot to count himself and he soon discovered his table was short one cookie. Sometimes a cookie dispenser handed out too few or too many cookies and the results were immediately apparent. Because it was time consuming, this procedure was not followed every day. On some days, other projects were given preference.

As the teacher ascertained the children's number skills, in various ways, she varied the cookie count to challenge the more advanced children who could count the children at two or more tables. Sometimes the teacher put a numbered card on each table and assigned children to numbered tables. When this practice was first introduced, the children had very meager knowledge of numerals and were quite unable to cope with this procedure. It was rescheduled, more successfully, later in the term.

Through Structured Materials. A bright fraction-board, introduced early in December, became a favorite puzzle-type toy which many children enjoyed manipulating. No guidance was offered by the teacher in the use of this material, and fractions were practically never mentioned. Like so many other materials such as cubes, pegs and assorted small blocks, the fraction-board stimulated considerable practice and manipulative play. A busy kindergarten needs a wide variety of such relatively "didactic" materials for self-chosen manipulation, play and discovery of some initial concepts about number, so that active teaching is supported and reinforced by much voluntary practice with structured materials on the part of children.

A numeral chart was posted near the ticket-clerk station to facilitate and encourage children's writing of numerals. Many other commercial materials were added for children's use during the year. Some of these, like the fraction-board, were used with little or no teacher guidance; others were used with considerable teacher guidance and structure in individual, small group or total group learning situations.

Guiding Practice Activities

With Commercial Games. The Creative Playthings Additive Set was selected, among other materials, for some directed work by the teacher. This set resembles a large domino set, but the spots are recessed as well as painted, and there are red and green wooden beads which fit into the grooves. Eight children, in pairs, were invited to work with this material, in turn. After the teacher demonstrated some ways of using this set, by working with one child while other children watched, the following types of exercises were practiced:

1. Find the block with one spot, or two, or four, and count the spots to see if the correct block was selected.
2. Find the same number of red (or green) beads. Count them. Is it the right number? Check it.

3. Match the beads to the spots. Is there a bead for each spot with no beads left over?

The first time this practice activity was scheduled, it was found that children stayed with it longer than the teacher wanted them to, even though four of the children had great difficulty in counting correctly to five. Regular work with this material was carried on, especially with those children who had scored lowest on the January mathematics inventory. In addition, it was also available for children's free manipulation and play, and some children spent as much as half-an-hour at a time playing with it.

With Clocks and Numerals. There were two wooden clock faces with moveable hands in use in the class for free manipulation and play. On March 22, the teacher made two clock charts which she later posted on a wall, one showing the 8:30 arrival time in school and the other showing the 11:30 dismissal time. Each chart also had a clear picture clue to identify arrival at and departure from school. The teacher later used the clock charts and the wooden clock faces for frequent comparison with the school's wall clock. Children began to practice setting the clock faces to accord with either the wall clock or one of the clock charts. This practice activity required numeral recognition and offered another opportunity to associate symbol and name as well as practice in clockwise direction.

For example, on March 30, there was a total class practice activity with the clock faces described in part as follows:

Bud and Stewart were selected to "fix" the clock faces.

Stewart quickly announced, "I fixed it!"

"Let me see it," the teacher said. "Is it right? Does it look like the big clock?"

"Yes," several children responded.

"He has the hands on the right numbers, but something's wrong," said the teacher.

One child said, "The little hand is wrong."

"The little hand should be on the 9 and the big hand on the 2. Stewart, fix it."

This was followed by practice in matching the clock faces to the clock charts with many children participating.

Only one week later, the children were attempting more complex clock manipulation, discussing "ten minutes to nine" and the half hour after each hour on the clock.

With Weather Charts. A classroom weather chart was introduced in March. In April, individual weather charts were duplicated so that each child could practice reading numerals, identifying the date and recording symbolic weather data. Work on the weather chart, which was a calendar for the month, included numeral recognition, counting the number of sunny or cloudy or rainy days in the current or preceding week and matching a weather symbol to the correct date. However, the children found the weather chart too complex and they became confused when asked to look at "this week" or "last week" on the calendar. It was apparent that more clues were needed to reduce the complexity of the stimuli. New charts were constructed, using one color for all the numerals on the first row and different colors for each row below. Thereafter, as children began to stabilize their ability to recognize and name colors, the teacher could say, "Let's look at this week on our calendar. This week is the second row and all the numbers in the second row are purple."

With Flannel Board Numerals. A flannel board with a box of flannel-backed numerals was introduced in March. Although children were permitted to play freely with them much of the time, there were times when the teacher used these materials for structured work with the children who needed such practice most. At these times she worked directly with one or two or three children, helping them to identify numerals, to match numerals, or simply to make a regular progression of numerals, starting at one.

The teacher continued to work with selected children at the flannel board, investing considerable imagination in its use. For example, on March 30, she crayonned pictures, put them out in multiples, as two snowmen, three policemen, four fish and asked the children to match correct numerals to each group.

With Geometric Shapes. A set of hardboard triangles, circles and squares in three colors and four sizes was also introduced in March. It was first offered for free play and manipulation. Later, the teacher worked directly with one or two children until she could plan further practice for some children by pairing a less-advanced with a more-advanced child.

Practice with these geometric shapes focused on distinguishing size, shape and color, naming and identifying these attributes, in effect, classifying. For example, the teacher might pick up the smallest blue circle and ask the child, "Which circle is bigger than this? Which is smaller?" Or one child would be asked to pick any circle; another child would be asked to match it or to pick one that was different in size or color. Or a child would be asked to pick up a circle or triangle or square or to name them.

For example, Polly, Dominic and Renee were working with the teacher one day as follows:

"Dominic, give Polly all the circles; give Renee all the triangles," the teacher said.

Dominic asked, "What's triangles?" Wilfredo, looking on, showed him.

"Polly, pick out all the blue circles," said the teacher.

"Like this?" asked Polly, pointing to a small blue circle.

"Yes," said the teacher. Then, "Polly, show me all the red circles. Count them. How many blue circles are there?"

"Four," said Polly.

The teacher asked again, "How many red circles?" Polly counted, "1, 2, 5, 6." "Let's count again," the teacher suggested. They spent the next few minutes counting together, slowly handling each object.

"Polly, show me all the circles this big," the teacher said.

Polly found the three circles of the requested size but counted to four. The teacher and Polly counted together several times, handling each object, to help Polly achieve a sense of correspondence of object to number.

One child, who enjoyed manipulating the hard, shiny, brightly colored geometric shapes was playing with them one day in mid-March. He juxtaposed the triangles so that they formed squares, then he showed his formation to the researcher, announcing that his triangles were now all squares. Although these materials were introduced first for free play and then highly structured by the teacher, it was noted that within a few weeks the children had so quickly mastered several variations of the "games" that their use had once again become self-selected, self-propelled and independent of teacher's guidance. More learning situations of this type are needed so that more children assume the burden of their own learning more of the time.

Playful manipulation of structured materials was often seen to help the child make intuitive leaps, as did the child cited immediately above when he saw how two triangles can form a square. Early childhood teachers usually value this kind of spontaneous learning by young children, but they sometimes think other kinds of learning are inappropriate.

In the demonstration classroom, the children needed the teacher's help to learn the names of the geometric shapes and their colors, in addition to words designating relative size, as smallest, largest, middle size. Intuitive leaps could not have been verbalized without the teacher's help. Without language to symbolize discovery of meaning, there seems to be a tendency for the meaning to be forgotten. In contrast to the child who has language

and can build on his discoveries and make further progress, a child who lacks the language symbolism may have to keep rediscovering the same meaning. Perhaps this is one of the reasons why such children have tended to make academic progress so slowly.

With Measurement of Height and Weight. Since the teacher was required to take height and weight measurements for each child for a permanent record, it was decided to utilize this routine as a demonstration in size comparisons with the children. The teacher made a card for each child, using a symbol for height (□) and one for weight (△). The following discussion introduced the measurement:

"We're going to be talking about 'low' and 'high.' There are other words for low and high. What other words can we use instead of low?" the teacher asked.

Children suggested, "flat," "down," "bigger." The teacher put her hand at a low level and called Eduardo, the smallest child in the class, to stand next to her. "What can we say about Eduardo?" she asked.

Children said, "low," "tall."

"How can we be low and tall at the same time?"

"Small," a child said.

"What else?"

"I'm more higher," another child volunteered.

"Yes," said the teacher, "but that's not the word to use. Look at Eduardo and Pedro. Eduardo is. . . small, and Pedro is. . . bigger."

"Let me see how tall all of you can get. Let me see you get tall - tall - tall as you can be. Now let me see how short - short - short you can be." The children suited their action to her words. "Today, we're going to be talking about short and tall. This is. . . ?"

"A ruler," said a child.

"And on it are numbers," the teacher added.
"Do you know what they are?"

The children chanted the numbers, counting from one to thirty-five, as the teacher pointed to each inch-mark on the yardstick. She noted that some rulers have higher numbers.

"Now," she said, "We're going to. . .?"

"Measure people," Jean interrupted.

"To see how," the teacher went on, (some children interrupted with 'weight') "tall you are. I'm going to measure each child."

The teacher then explained the two symbols on the card and said that she was also going to weigh each child. She called the children's attention to the difference between the shortest and tallest child, and between thin and chubby children. She, herself, stepped on the scale and the children helped her to read it. The teacher mentioned that, after height and weight measurements were taken, a certain kind of picture would be made to see who was shortest, tallest, fattest and skinniest. The children hung on every word of this twenty-minute total class discussion, which took place on May 21. At this point, the teacher announced playtime for the class, and, as free play began, she called children one at a time and weighed and measured them, recording the measurements on the prepared cards which the children wore like necklaces.

As she measured each child, the teacher put her finger on the correct inch mark and asked the child to read the numeral. There was considerable variation in the children's ability to read two-digit numbers, from Sam who read a "four" as "eleven," Stewart who read a "five" and a "zero" but did not know it was "fifty," to Joan who not only read "forty-five" correctly but noted that her height was near this mark but not exactly on it. More girls than boys seemed able to read the numbers. Many of the children also indicated they remembered which was the height and which the weight symbol on their cards.

When Wilfredo was called to be measured, his friend, Sam, shouted to him to remove his hat, so he would not be too tall. Several children discovered their cards showed the same height and came, giggling, to show this to the teacher. Stewart showed the researcher the numeral "47" on the yardstick, which corresponded with the height recorded on his card, saying, "This is where I reach."

The scale, which had numerals only by tens, was much more difficult for the children to read, although some children noted the nearest numerals. After Sam was weighed, he remarked to the researcher, "Same pounds as same tall," meaning his height and weight were the same number. But when he looked at Dominic's card and said, "He got the same too," the teacher corrected him, pointing out that they looked the same but were in different order because Dominic's numerals were "34" and "43".

After the measurement was completed, the teacher prepared a "special picture," as she had promised, using the height measurements, to show children by name in ascending order of height from forty-three to fifty inches. The teacher said:

We're going to make a picture of all the children, but this picture won't have any face or hair or legs or dresses. It's going to be a picture made only out of lines. A picture made out of lines is called a graph. I'm going to put it on this kind of paper, (large rectangle of colored construction paper, eighteen by twenty-four inches). It's going to show people how tall you are. If your height is this number (pointing to 43 on the chart), come up here. Dominic is right. Eduardo is right. If your number says "43," you will stand here. They are both the same height. Take your cards off and hold them in your hands so you can see your number, then put them on again."

In this way the teacher called out each height from forty-three inches on, and asked the children to watch their cards for their numbers to be called. She noted

when several children had the same number. She listed the children's names on the chart, then called the next number. Meanwhile, the children remained lined up in the order in which they were listed on the chart. When all names had been listed, most of the children instantly located their place on the chart. Since name recognition had been achieved by all the children long since, perhaps this was not surprising.

Work symbolizing the group's height measurements by ascending lines was not repeated because it was very late in the school year and the teacher felt pressed by various end-of-school tasks. Had this work been started earlier, it could have been repeated and similar work could have been done by weight and a histogram could have been constructed to represent the weight distribution of the class. While this kind of planned activity could not be completed, even this brief classroom experience indicated how much more work of this type could be done, with great benefit to children's growing perceptions and understandings of symbolic representation, as well as experience with numerals and numbers.

It will be noted that many of the mathematics learning goals were approached through incidental situations, through children's self-initiated play and practice, and through purposefully structured and teacher guided activities. Although teaching strategies were determined, for the most part, by data secured from recorded observations, other data, gathered by a mathematics inventory, were also quite useful in particularizing the teacher's work with individual children.

Mathematics Inventory

The researchers devised a brief test of some basic mathematics concepts which was administered in January and, again, in May. Each child was tested individually by the researcher, who selected children randomly to test at both times. The mathematics inventory, as it was called, used

a set of colored wooden cubes to assess each child's understanding of counting on a one-to-one relationship, of grouping small sets and of equality and inequality of sets. See Appendix B for detailed description of the procedure followed and the scoring key. Since it was not possible to administer this test to the comparison class, it cannot be determined whether the gains made by the demonstration group differ substantially from average gains in other kindergarten classes.

As shown on Table VIII, significant gains in these basic mathematical concepts occurred over this three-month period. Gains in the total score, for the total group, were significant at the .001 level, and rose from a mean of 21.8 to 26.7, toward a maximum possible score of 30. Girls' scores, which were slightly higher on the pretest, rose somewhat more than the boys' scores, but gains were similar in both groups. Boys' variability was greater, with greater standard deviations generally. Scores were combined for grouping and counting, since these procedures were not separable in the test format. Sub-scores on these items approximated the trends for total scores and this would be expected since these items constituted two-thirds of the test scores. On the sub-scores for equality and inequality of sets, however, girls' scores were slightly lower than boys' scores on the pretest but were slightly higher on the posttest. The gain in boys' scores on this item was the only gain which was not significant at a five percent level or better.

Since individual work on mathematics concepts was scheduled by the teacher for the children who scored lowest on the initial inventory test, the results showing significant gains on the posttest would appear to support the hypothesis that appropriate teaching strategies can contribute to improving children's learning strategies in specific areas of content and concepts. Of the seven children who scored lowest on the pretest, all but one made large score gains on the posttest, as shown on Table IX. However, gains were not limited to the low scorers and the variability in scores and in score increases is apparent from the listing on Table IX. It is noteworthy that sub-scores on grouping and counting invariably showed gains, except for a very slight negative change for one

Table VIII

Math Inventory: Raw Scores, Means And Standard Deviations, Pretest And Posttest, By Sex

	Pretest		Posttest		Gain	
	Mean	SD	Mean	SD	Mean	SD
Total Score (Maximum Possi- ble Score of 30)						
Total	21.8	7.6	26.7	5.5	5.0	5.2
Boys	21.4	8.4	25.5	6.9	4.1	5.0
Girls	22.2	6.7	28.4	3.3	6.2	5.3
Grouping and Counting (Maximum Possi- ble Score of 20)						
Total	14.4	5.8	17.4	4.5	3.0	4.1
Boys	13.8	11.7	16.5	5.6	2.7	3.8
Girls	15.3	5.2	18.6	2.7	3.3	4.5
Sets, Equality and Inequality (Maximum Possi- ble Score of 10)						
Total	7.3	2.9	9.3	1.8	2.0	3.1
Boys	7.6	3.1	9.0	2.1	1.4*	3.4
Girls	6.9	2.4	9.8	0.6	2.9	2.2

* This is the only gain which is not significant at the 5 percent level or less. All the other gains are significant, most at the 1 percent level or less, all at the 5 percent level.

Table IX

Math Inventory: Raw Scores, Mean And Individual,
By Child, By Sex And By Test Item, Pretest And Posttest

Sub- ject	Total Score			Grouping and Counting			Sets, Equality and Inequality		
	Pre- test	Post- test	Gain ¹	Pre- test	Post- test	Gain	Pre- test	Post- test	Gain
Total Mean	22.0	26.9	4.9	14.4	17.3	2.9	7.3	9.3	2.0
Boys Mean	21.4	25.7	4.3	13.9	16.5	2.6	7.6	9.0	1.4
1	30	30	0	20	20	0	10	10	0
2	8	5	-3	3	3	0	5	2	-3
3	28	30	2	20	20	0	8	10	2
4	30	30	0	20	20	0	10	10	0
5	15	25	10	12	16	4	3	9	6
6	17	26	9	7	19	12	10	7	-3
7	9	21	12	9	11	2	0	10	10
8	30	30	0	20	20	0	10	10	0
9	23	27	4	14	19	5	9	8	-1
10	28	30	2	18	20	2	10	10	0
11	12	26	14	6	16	10	6	10	4
12	27	30	3	17	20	3	10	10	0
13	30	30	0	20	20	0	10	10	0
14	13	17	4	7	7	0	6	10	4
Girls Mean	22.6	28.6	6.0 ¹	15.3	18.6	3.3	6.9	9.8	2.9
1	21	30	9	15	20	5	6	10	4
2	27	30	3	19	20	1	8	10	2
3	28	30	2	18	20	2	10	10	0
4	25	30	5	20	20	0	5	10	5
5	11	19	8	8	11	3	3	8	5
6	13	30	17	7	20	13	5	10	4
7	30	30	0	20	20	0	10	10	0
8	30	30	0	20	20	0	10	10	0
9	15	28	13	8	18	10	7	10	3
10	22	27	5	18	17	-1	4	10	6

1 Plus sign omitted

of the girls. The more complex concept of equality and inequality of sets, which may hinge on language comprehension as much as on mathematical conception, showed less stability, with three negative score changes, or declines, from the pretest to the posttest. The teaching focus was, primarily, on counting. Observational records do not permit an assessment of the apportionment of teaching time as between these items, but it can be stated confidently that very little teaching time focused on concepts of equality and inequality of sets.

The major values of this inventory were in measuring individual children's progress toward the selected goals and in mapping for the teacher specific learning needs of specified children. The teacher in the demonstration class did not really perceive the possibilities or values she could have derived from these inventory scores until the year was almost over. She was so strongly attached to her ideal of spontaneous teaching that she was unaware, for a long time, that spontaneity might still operate within more clearly defined teaching boundaries. One of her greatest strengths as a teacher lay in her insistence on trusting her own convictions, based on her own experiences. It was interesting, and hopeful, that the experience in this program did, eventually, contribute to changing this teacher's convictions.

Summary and Implications

The two broad goals in the mathematics curriculum were: (1) to help children advance in their initial understandings of mathematics concepts and (2) to help them achieve more efficient learning strategies. It was hypothesized that a range of teaching strategies was necessary to accomplish these goals and that this range should encompass both incidental and structured teaching. From findings of both the pilot and the demonstration studies, the following summary and implications for teaching can be made:

1. Conceiving the scope of the mathematics curriculum to include perception and naming of sets, one-to-one correspondence, counting, grouping, geometric shapes, measurements, money and symbolic representation provided a base for continuity of learning beyond the kindergarten year.
2. Clearly stated goals facilitated the selection of activities and experiences, many of which were also integrated with principal content of the social science program.
3. Providing materials for incidental mathematics learning was productive for learning in that it offered practice opportunities in a free choice situation in support of a child's growing autonomy.
4. Incidental teaching was effective in capitalizing, at a time of high motivation, on children's awareness of the obvious utility and value of these learnings.
5. The expanded period of self-selected play offered the teacher unparalleled feedback as to the children's perceptions, their unique ways of using information and, especially, their confusions and misconceptions and need for guidance.
6. The expanded play period, dominated by productive and challenging play opportunities, permitted the teacher to have more time for carefully planned learning episodes with individual or small groups of children.
7. Incidental teaching is insufficient for helping deprived children build a reliable base of mathematics understandings. Some structured programming is required to insure their encounter with the necessary range of beginning concepts and to provide the language necessary to support and stabilize the meaning of these encounters.

8. All topics are not equally fruitful in providing learning opportunities in mathematics through spontaneous play and manipulative activities. Comparing the topic of "Providing For Family Food Needs" in the pilot study with that of "Air Transport" in the demonstration study, it is evident that the former was more productive in stimulating mathematics-related play than the latter. One implication that can be derived from this facet of the study points to the need for more order and pattern in planned and structured episodes in order to make possible greater control by the teacher and more learning by the children.
9. Structuring of learning episodes is best viewed as a continuum of patterning so that one situation is distinguished from another chiefly by which elements are patterned or structured and the relative degree of structuring. Structuring episodes which contain elements of individual manipulation, reflection and application are particularly fruitful as teaching strategies.
10. A wide variety of equipment, some of which have built-in self-correcting features, are important in providing materials for discovery and voluntary practice in support of more direct teaching.
11. An inventory, taken individually for each child, has major value in measuring progress toward the goals of the mathematics program in behavioral terms and in offering guidelines to the teacher as to the specific learning needs of particular children.
12. Even though some changes appeared in the teacher's instructional behavior toward the end of the pilot study, these changes were apparently not sufficiently understood or stabilized to carry over into the following period of the demonstration study. Considerable time and sustained effort are evidently required to bring about behavioral change in teachers.

13. Gradually, through continued communication, discussion and demonstration, the teacher came to understand the proposed teaching strategies more clearly, and, after the first half of the school year, she began to make these strategies her own.
14. As the teacher gained a clearer understanding of the new curriculum with its clearly defined goals, she was gradually able to develop new teaching strategies that helped children toward modes of learning that may well increase their potential for further academic success.
15. The evaluation of whether the new program will, indeed, result in children's gaining more productive learning strategies for subsequent school experience must rely on a more extended longitudinal study of these children.

CHAPTER VI

Language Development

One of the specific objectives of the demonstration project was to help the children develop efficient learning strategies utilizing various forms of verbal symbolization through selectively structured experiences and play activities. The verbal skills listed as prime needs for these children were:

1. Names, labels, vocabulary.
2. Fluency of communication.
3. Language structure, sentence forms.
4. Esthetic quality of expressiveness, colorfulness, affective qualities of oral language.

Plans for the study included providing for many forms of communication to foster conceptualization through language; providing relevant vocabulary and stimulating its use; stimulating use of language to associate ideas, to recall and relate information and ideas, to apply information and ideas, to test hunches and ideas, to classify and categorize, to generalize, to discover cause-and-effect relationships, and to develop more advanced forms of sentence structure and more standard grammatical usage. Based on detailed study of the children's language, their most important need appeared to be a larger, functional vocabulary, but they also evidenced conspicuous deficits in fluency, standard syntax, enunciation and pronunciation.

The demonstration class had complex language problems. The majority of the children came from Spanish-speaking homes and none of these children was really fluent in English. Moreover, some Puerto Rican parents discouraged their children's use of Spanish in school, hoping to hasten their learning of English. Other children included Negro children, with non-standard modes of speech and a few child-

ren from homes where other languages as Greek or Italian were mainly spoken.

Design for Language Growth

The researchers hoped to improve language skills through intellectually stimulating experiences and play situations, which would require expanded verbalization, in addition to planned exercises and structured learning situations. Language was conceived as man's essential means of encoding and decoding experience, of understanding and communicating ideas, feelings, attitudes and needs. Therefore, all language activities were planned as integral parts of activities which were either direct experiences, forms of play or manipulation of things, or structured experiences involving some or all of these elements.

Both in the one-term pilot study and the following seven month demonstration study, the major sources of intellectual stimulation were drawn from a few key concepts from the social sciences and mathematics, as detailed in Chapters IV and V. The content, selected as worthy of these deprived kindergarten children, constituted significant and basic ideas from some important bodies of knowledge. Children could not be expected to be intellectually stimulated for long periods of time by trivial and superficial content, it was thought. Significant ideas are not readily exhausted. They furnish intrinsic interest, they suggest possibilities of novelty, change, excitement, discovery and, above all, of development. Selected vocabulary was derived from this content. Genuine interest and depth of probing could be sustained, the researchers predicted, by content which could be of significance to children's lives in the immediate present and which could be basic to subsequent learning.

Methodologies used to further language progress included the wide range most kindergartens use, with much more emphasis both on free, spontaneous play and on planned and structured learning episodes. Work with individual children and with very small groups, in structured learning episodes, supplemented many total class experiences in language, as described below.

Equipment and materials also included a varied assortment of toys, games, props and conventional kindergarten materials in addition to almost daily use of a tape recorder and such other mechanical devices as phonographs, telephones, slide and filmstrip projectors and cameras. Thus manipulative and play materials were supplemented by mechanical and other forms of structured learning situations.

The design for language growth may be described as:

1. A series of intellectually-stimulating experiences, through which the children could build meaning and vocabulary through personal involvement and responses to some exciting and distinctive encounters with their environment, some of which would be very close to home and others further removed.
2. Classroom play situations, inviting specific types of role-playing and dramatizations, through teacher guidance and the provision of props, uniforms and materials suggestive of the desired roles and content.
3. Scheduled classroom work periods for total class discussions, small group and teacher-child discussion, to feature verbalization of newly acquired meanings and vocabulary and to clarify and stabilize new understandings.
4. Structured practice activities under teacher supervision for individual and small groups of children, to practice naming objects and using standard English sentence structure.
5. Use of mechanical devices such as telephones, tape recorders, phonograph records and the public address system, to increase children's opportunities to listen, to respond to, and to practice the use of standard English. Mechanical devices were also used to stimulate and to increase children's opportunities to retell stories, to describe personal or group experiences, to recall the sequence of experiences and to augment self-concepts of children in their appreciation of their own and other children's progress and accomplishments.

6. Encouragement of esthetic qualities of expressive and colorful language by stimulating activities. Provisions for many opportunities for children to verbalize their feelings and reactions to classroom and non-classroom experiences. Help for children in overcoming shyness and inhibition through dynamics of classroom interpersonal relationships and through rewarding children's efforts in this direction by direct, primarily verbal, approval.

Language Deficits

"Git offa here!" "Dis ain't no big enough," or "I don't got no milk," are examples of language structure frequently heard in kindergarten classrooms where disadvantaged children predominate. They point up some of the kinds of language deficits of these children.

Many examples can be cited of specific language problems in this class, but only a few will be detailed here. In November, when the teacher was asking children to retell stories from books which they had been allowed to take home for a week, Sam had to be prompted every few words. When the teacher asked him what the Indian boy did in the story when his horse broke a leg, Sam said, "He 'tached round the foot," meaning he put a bandage around the horse's leg. On December 3, when Maria threatened to tell the teacher that Alfredo said he was going to break her airplane block structure, Alfredo hastened to cover himself with, "I no gonna bust it."

Other examples of non-standard speech included these:

"I gone 'a movies wid daddy."
 "Candy we was eating, popcorns, we were. . . ."
 "'n first her always hit my baby boy when he didn'. . . ."
 "'n den we first rided 'n doin' our home work, dat's what our doing."
 "Mudda, fadda said 'What happened?'"
 "Dey knocked it down de doors 'n winders."
 "Yesterday when my mud (mother) was cooking, she see a rat, inna door, inna side, when he get, he bite her."
 "He gots-a, gots-a soldiers like mine."

"He, he 'brods' (brought) himself a bird."
 "I want to be a telephone in my house."
 "Um, he take people, suitcase inna airplane."
 "Dis is story I was gonna tell you."
 "Dey havta put 'em in dat t'ing, inna de t'ing, de
 put dem in, de seat belts, dey eat on da - all de
 t'ing de want, an' den I see, I wen' to de airport
 wid my fadder, my mudder, an' I watch da airplane
 to come back to New York."
 "I has one sister and a brother."

Among the language samples tape recorded by children in individual interviews, there were such non-standard phrases and sentences as, "...my mudder brang good dere," "And my mother didn't was there," or "...da milk was no more left." Often children struggled and floundered in language tangles, unable to dredge up the required words.

Bruner points out that children must be able to translate their experiences into symbolic form, that is, language, in order to deal with those things which are remote in time or space or somehow not physically present.¹ Therefore, language emphasis became an integral part and function of the total curriculum in its dual role as social communication and as an indispensable tool for conceptualization.

The "non-verbal" label frequently applied to disadvantaged children has not been supported by the data acquired from frequent interviews, recordings, and observations of the children in this study. One five-year-old, whose interview was tape recorded, agreed to tell a story, which follows:

1. Jerome S. Bruner, "The Course of Cognitive Growth," American Psychologist, January 1964, Vol. 19, No. 1, p. 13.

"Once upon a time there was a little mommy. Mommy came right up to de little girl 'n de little girl named Lottie her was a bear, a little bear named Goldy. Goldilock was sleepin' 'n de bed 'n so, uh, de bear said, "Somebody been eatin' my porri (porridge)" 'n the little mommy said, "Somebody been eatin' my porri." 'N so they went upstairs 'n there was Goldilock. Goldilocks sleepin' in de bed 'n so Goldilock was sleep fast. In den, uh, her run, 'cause it was a bear. 'N de bear live inna ol' bear house. 'N so her went her, 'n de de baby, de baby bear' was cryin' 'cause Goldilocks, uh, broke his, her chair, uh 'n so Goldilocks mudder came 'n, her mudder was named Goldilocks, 'n her turn de wheel 'n her wanna listen to de voice of Goldilock boyfriend. 'N so there wasn't no boyfriend, only was a bear. So the mommas tol' her her come right over 'n so her speak to her."

Other children, from different ethnic backgrounds, told stories which reflected similar problems of enunciation, pronunciation, syntax, vocabulary and standard English sentence structure. They generally were quite limited in their knowledge and use of classifying terms. For example, they did not know that they, as individuals, made up their kindergarten class or that apples, bananas and oranges are classified as fruit. Most children, unlike their middle class counterparts, had so little familiarity with written symbols that they could neither recognize nor write their own names, failed to use picture clues in many instances, and could not identify a map by name or by its use.

Karplus has said, "The function of education is to guide children's development by providing them with particularly informative and suggestive experiences as a base for their abstractions. At the same time, children must be provided with a conceptual framework that permits them to perceive the phenomena in a meaningful way and to integrate their inferences into generalizations of lasting value."²

2. Robert Karplus, "One Physicist Looks at Science Education," in Passow, Harry A. and Robert R. Leeper (eds.), Intellectual Development: Another Look, Washington, D.C.: Association for Supervision and Curriculum Development, 1964, p. 81.

The children's meager vocabulary often inhibited their ability to obtain meaning from their personal experiences. The narrow range of their experiences outside of school was a further limitation on their ability to expand vocabularies quickly since there were so many facets of their environment which constituted unknown or un-knowable information and ideas. The Spanish-speaking children, even when their inhibitions were reduced, were frequently unable to supply a Spanish word for a rather common object or expression. These children were not only limited in their English language abilities but their verbal skills in their native language were often demonstrated to be exceedingly meager.

Language Analysis

Taped interviews with each child by the researchers were analyzed for verbal skill development. Interviews were held in November-December, as the demonstration project began and in April-May, as it drew to a close, an average elapsed period of about four months. The purpose of these interview-tests was to sample the children's verbal skills under comparable conditions, in order to determine the extent of any changes which might have occurred.

The researchers recognized, very early in the study, that in this group, as in others no doubt, the "non-verbal" label was most inappropriate. That is, these children chatted with each other, and with friendly adults they came to know, with spontaneity and a considerable flow of language. Interviewing them was another matter. Even when they were natural, affectionate and eager to please, the interview format tended to dam the language flow, to elicit gesture instead of speech or one-word responses. Had the study received earlier funding, it would have been possible to record, or to tape, numerous spontaneous speech samples for each child, during play periods, which would have been much more reflective of the child's natural speech patterns, which had infinitely greater fluency, colorful language and communication skill than did the interview samples. However, the interview samples may be regarded as characteristic school responses of these children to teachers and other adults, with the implied constraint, self-consciousness, expectation of judgmental comments and, perhaps, desire not to expose oneself, or one's thoughts, unnecessarily.

The interviews were conducted in a teachers' lunch room, which was located across the hall from the kindergarten class. Teachers came and went, sometimes chatting in small groups as they used this room during preparation periods. Interruptions were frequent and interviews were often suspended for several minutes until teachers' voices subsided so that the tape recording could continue. Unfortunately, it was not possible to work in a more quiet and private space, in this busy, crowded school. The researchers agreed that, since the interview purpose was to record characteristic school language, interviews were to be sparked by one or more of several devices, whichever were successful. The children could be asked to play with some objects which were provided to stimulate speech, such as some miniature pots and cutlery from the kindergarten housekeeping corner, or a small flannel board and flannel cutouts which focused either on the child's family and home life or on group trips which the children had taken at school. With some children, these techniques were used in succession and were minimally effective to stimulate abundant speech.

Interviews were limited to 10 to 12 minutes, in most cases, except where interruptions lasted for more than 2 or 3 minutes. A few interviews were redone because either interruptions or the child's unresponsiveness contributed to very sparse responses. It was found, however, that a child who responded very little to the interview format on one occasion, responded minimally on a second try. Often it was the child who ended the interview, by saying insistently, "That's all." All but one of the children were tested before and after, making a total of 24 interviews each time.

When the researchers transcribed these taped interviews, they agreed that there was no difficulty in identifying the beginning and ending of sentences, since the children's voices usually rose and fell in expected patterns of intonation. However, sentence definition was sometimes unclear when connective "and" was used liberally or where run-on sentences could not always be clearly defined.

A research assistant skilled in linguistic analysis assisted in classifying the utterances and the items in each

utterance. The researchers agreed upon definitions of categories, generally following those used by Thomas.³ However, Thomas' category of sentences "functionally complete but structurally incomplete" was omitted and distinctions were made between structurally complete and incomplete sentences, adding Loban's category of "language mazes," to provide an adequate category for such tangled utterances.⁴ After the research assistant completed her classification of the language samples and resolved all doubtful decisions with the researchers, she was requested to make a second, independent classification of about half the interview transcriptions. The researchers found, comparing the two classification efforts of the same material, that identical classifications were made in over 95 percent of the items classified.

Progress in school verbal skills, as indicated by Table X, occurred chiefly in number of words and sentences uttered, and in use of descriptive language. These changes indicate a greater flow of language and greater ability to communicate more precisely through descriptive language. There was a mean gain of 21.5 sentences and of over 109 words per interview. Both of these gains were significant at the .001 level. However, there was a gain of only 0.3 words per sentence, from pretest to posttest. The girls made greater gains than the boys and achieved higher mean scores on pretests and posttests, as might be expected.

3. Dominic Thomas, "Oral Language Sentence Structure and Vocabulary of Kindergarten Children Living in Low Socio-Economic Areas," doctor of education project, Detroit, Wayne State University, 1962.

4. Walter Loban, The Language of Elementary School Children, Champaign, Ill., National Council of Teachers of English, NCTE Report No. 1, 1963.

Table X

Language Samples of Demonstration Group: Mean Number of Words and Sentences, and Words Per Sentence and Numbers and Proportion of Grammatical Forms, By Sex, Pretest, Posttest and Gains.

Item	Total (n=24)			Boys (n=13)			Girls (n=11)		
	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
Mean									
No. of Sentences	31.8	53.4	21.6*	29.8	45.2	15.4	34.2	63.1	28.9
No. of Words	139.2	248.5	109.3*	104.5	199.1	94.6	180.2	307.0	126.8
No. of Words Per Sentence	4.4	4.7	0.3	3.6	4.4	0.8	5.3	4.9	-0.4
Grammatical Forms									
Nouns, Pronouns, Verbs									
Mean	83.2	143.3	60.1	62.2	114.6	52.4	108.0	177.3	69.3
Proportion ¹	59.8	57.7	-2.1	59.5	57.6	-1.9	59.9	57.8	-2.1
All Other Words: Mean	56.0	105.2	49.2	42.3	84.5	42.2	72.2	129.7	57.5
Proportion	40.2	42.3	2.1	40.5	42.4	1.9	40.1	42.2	2.1
All Nouns: Mean	30.8	50.5	19.7	24.0	38.6	14.6	38.7	64.6	25.9
Proportion	22.1	20.3	-1.8	23.0	19.4	-3.6	21.5	21.0	-0.5
All Pronouns: Mean	22.0	39.1	17.1	15.9	33.5	17.6	29.2	45.7	16.5
Proportion	15.8	15.7	-0.1	15.2	16.8	1.6	16.2	14.9	-1.3
All Verbs: Mean	30.4	53.7	23.3	22.2	42.5	20.3	40.1	66.9	26.8
Proportion	21.8	21.6	-0.2	21.2	21.3	0.1	22.3	21.8	-0.5
All Adjectives: Mean	19.6	37.2	17.6	14.8	29.6	14.8	25.3	46.2	20.9
Proportion	14.1	15.0	0.9	14.2	14.9	0.7	14.0	15.0	1.0
All Adverbs: Mean	9.6	17.2	7.6	5.5	14.8	9.3	14.5	20.1	5.6
Proportion	6.9	6.9	0.0	5.3	7.4	2.1	8.0	6.5	-1.5

Table X (cont'd.)

Item	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
All Prepositions:									
Mean	11.0	20.0	9.0	8.7	16.2	7.5	13.7	24.4	10.7
Proportion	7.9	8.0	0.1	8.3	8.1	-0.2	7.6	7.9	0.3
"Yes" and "No" Words:									
Mean	5.0	10.3	5.3	6.5	8.9	2.4	3.3	11.8	8.5
Proportion	3.6	4.1	0.5	6.2	4.5	-1.7	1.8	3.8	2.0
Other Words:									
Mean	10.8	20.6	9.8	6.8	14.9	8.1	15.5	27.3	11.8
Proportion	7.8	8.3	0.5	6.5	7.5	1.0	8.6	8.9	0.3

* $P < .001$

1. Proportion of total number of words.

There was a small increase in the number and proportion of words which were not nouns, pronouns or verbs. Thus, the posttest interviews showed gains in use of words which were adjectives, adverbs and prepositions. While this was not a significant gain, it suggests some movement in the direction of more mature speech. It is interesting to compare mean number of words per sentence in this study with Thomas' study, based on 2 groups of Negro and white children in low socio-economic areas⁵ and with Templin's study of middle-class children⁶:

Mean Number of Words Per Sentence

	<u>Total</u>	<u>Boys</u>	<u>Girls</u>
Present Study - Posttest	4.7	4.4	4.9
Thomas' Study - Total	5.7	5.1	6.2
Negro	5.1	4.2	5.9
White	6.2	5.9	6.5
Templin - Middle-Class	6.6	6.7	6.4

This comparison is a further reflection of the language problems of the children in the demonstration study, especially those who were bi-lingual, since their mean scores were even lower than the scores Thomas found for low socio-economic Negro children.

Thomas found, comparing his data based on kindergarten children in low socio-economic areas with Templin's based on middle-class children, that the latter used longer sentences and a greater number and variety of words, with fewer grammatical errors and incomplete sentences.⁷ He found only

5. Thomas, op. cit., p. 44.

6. Templin's data show a mean of 6.9 for upper socio-economic and 6.4 for lower socio-economic groups.

7. Ibid, p. 100.

slight differences in use of parts of speech. This finding is in accord with Loban's conclusion that differences are notable between subjects in different socio-economic groups, not in structural patterns of speech primarily, but "...in the dexterity with which subjects use elements within these structures."⁸

Table XI indicated that very little change in patterns of sentence structure was achieved by the demonstration group during the study. The majority of utterances were classified as simple sentences, without phrases. Such sentences constituted 58 percent of all utterances, in before and after interviews. There was a small gain in the proportion of simple sentences with phrases, from 12.6 to 16.1 percent. Other small changes included decreases in language mazes, from 8.5 to 2.8 percent⁹ of all utterances, and in incomplete sentences and a slight increase in complex sentences. These may be further suggestions of improving fluency of communication.

It is noteworthy that grammatical errors did not decline with increasing language fluency. Table XII shows that the mean number of grammatical errors increased with the increased flow of words, from 35.8 to 54.5 for the group. However, the mean number of errors per sentence remained practically unchanged at slightly more than one per sentence. Very small declines were noted in the use of colloquial and slang expressions and in errors in article or pronoun use. Lack of change in grammatical usage may reflect children's

8. Walter Loban, The Language of Elementary School Children, Champaign, Illinois, National Council of Teachers of English, NCTE Research Report No. 1, 1963, p. 84.

9. Language mazes are used here in the sense in which Loban defines them as, "...a series of words or initial parts of words which do not add up, either to meaningful communication or to structural units of communication as defined in the research.", in Loban, op. cit., page 8.

Table XI

Language Samples of Demonstration Group: Means and Proportions of Diverse Sentence Structures and Language Tangles, By Sex, Pretest and Posttest and Gains.

Item	Total (n=24)			Boys (n=13)			Girls (n=11)		
	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
Sentence Structure									
Incomplete Sentence									
Mean	5.2	8.3	3.1	4.7	7.0	2.3	5.7	9.9	4.2
Proportion ¹	16.4	15.5	-0.9	15.8	15.5	-0.3	16.7	15.7	-1.0
Simple - Sentence									
No Phrase									
Mean	18.5	30.9	12.4	18.9	27.2	8.3	17.9	35.3	17.4
Proportion	58.2	57.9	-0.3	63.4	60.2	-3.2	52.3	55.9	3.6
Simple Sentence - With Phrase									
Mean	4.0	8.6	4.6	3.7	7.2	3.5	4.5	10.4	5.9
Proportion	12.6	16.1	3.5	12.4	15.9	3.5	13.2	16.5	3.3
Compound Sentence									
Mean	2.2	2.3	0.1	0.8	1.2	0.4	3.8	3.6	-0.2
Proportion	6.9	4.3	-2.6	2.7	2.7	0.0	11.1	5.7	-5.4
Complex Sentence									
Mean	1.3	2.5	1.2	1.1	1.8	0.7	1.5	3.2	1.7
Proportion	4.1	4.7	0.6	3.7	4.0	0.3	4.4	5.1	0.7
Language Mazes									
Mean	2.7	1.5	-1.2*	3.0	1.3	-1.7	2.1	1.6	-0.5
Proportion	8.5	2.8	-5.7	10.1	2.9	-7.2	6.1	2.5	-3.6

* P<.001

1. Proportion of total number of sentences.

Table XII

Language Samples of Demonstration Group: Grammatical Errors, Mean Number, Major Types and Proportion of All Errors, By Sex, Pretest, Posttest and Gains.

Total (n=24)				Boys (n=13)			Girls (n=11)		
Grammatical Errors	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain	Pre-test	Post-test	Gain
Total Number: Mean Errors Per Sentence	35.8	54.5	18.7	28.6	54.2	25.6	44.4	54.8	10.4
Mean	1.1	1.0	-0.1	1.0	1.2	0.2	1.3	0.9	-0.4
Incomplete Sentence:									
Mean Proportion ¹	5.1 14.2	8.4 15.4	3.3 1.2	4.7 16.4	7.1 13.1	2.4 -3.3	5.6 12.6	9.9 18.1	4.3 5.5
Incorrect Verb Form:									
Mean Proportion	4.0 11.2	7.0 12.8	3.0 1.6	3.4 11.9	6.5 12.0	3.1 0.1	4.8 10.8	7.5 13.7	2.7 2.9
Sentence Begins "And":									
Mean Proportion	3.2 8.9	5.3 9.7	2.1 0.8	1.8 6.3	4.3 7.9	2.5 1.6	4.9 11.0	6.5 11.9	1.6 0.9
Colloquial and Slang Expressions:									
Mean Proportion	19.8 53.9	25.6 47.0	5.8 -6.9	15.8 55.2	28.3 52.2	12.5 -3.0	23.4 52.7	22.4 40.9	-1.0 -11.8
Incorrect Article or Pronoun:									
Mean Proportion	1.9 5.3	2.2 4.0	0.3 -1.3	1.4 4.9	2.3 4.2	0.9 -0.7	2.5 5.6	2.0 3.6	-0.5 -2.0
All Other Errors ² :									
Mean Proportion	2.3 6.4	6.0 11.0	3.7 4.6	1.5 5.2	5.6 10.3	4.1 5.1	3.1 7.0	6.5 11.9	3.4 4.9

1. Proportion of total errors.
2. Includes double negative, incorrect word order, faulty contraction, word omissions, etc.

need to keep their language usage in consonance with home patterns of English speech. Other researchers have suggested the need to add a school dialect to children's speech repertoire rather than to eliminate colloquial speech patterns.

It was not possible to schedule a series of comparable interviews in the comparison class. Indeed, these would have lacked comparability in any case, since the researchers knew the children well in the demonstration classroom during that academic year and they had no contact with the comparison group during the period that intervened between test administrations. The greater rapport of the children in the demonstration group with the researchers, on the post interviews, may be a factor in improved results. By this time, the researchers knew a great deal about these children and their families, as well as the personality characteristics of individual children and this may have contributed to greater ease of communication, longer utterances and extended conversation.

Table X indicates colloquial and slang expressions constituted the largest single source of errors in the demonstration group's language. Incomplete sentences took second place in the proportion of errors found and incorrect verb forms were third. Thomas' study indicated that 40 percent of total responses in his study were functionally complete but structurally incomplete sentences.¹⁰ Loban found problems with use of verbs the most frequent deviation from conventional usage. He also found appropriate use of the verb to be proved twelve times as troublesome for Negro children with Southern background than for northern Caucasian or Negro children.¹¹ This verb was found to be very troublesome to the demonstration group, both to the Negro children and the Spanish-speaking children. While the Thomas data and the data from the demon-

10. Thomas, op. cit., p. 49.

11. Loban, op. cit., pp. 84-85.

stration project both indicate substantial proportions of utterances of kindergarten children in low socio-economic areas tend to be incomplete, Templin found a somewhat smaller proportion of incomplete utterances by middle-class children, and higher proportions of simple sentences with phrase, of compound and complex sentences and of elaborated sentences.¹²

In consideration of the very poor English language skills possessed by the demonstration group at the beginning of the study, it may be concluded that prime initial goals of language flow and increased and improved communications efforts were achieved. Significant vocabulary improvement is shown by the definitions test and by analysis of word usage in observational recordings. Further goals for such children as these would appear to require continued increase in language flow accompanied by gradual acquisition of the school's English standard speech patterns, especially in the direction of completed sentences and appropriate verb forms.

Teaching Strategies

It has been stressed throughout this study that these disadvantaged children needed content to study, because of the paucity of their own experiences and understandings. The content was offered through hitherto-inaccessible sources of first-hand information about contemporary life, such as those centering on air transport, as well as through familiar local experiences which were not new. Both types of sources were used to help children gather needed information and arrange it in some orderly, meaningful fashion.

Vivid and novel experiences were expected to illumine and clarify much of the child's world. The excitement and interest of those experiences stimulated rapid vocabulary growth as new objects and elements had to be named, recalled, referred to, and classified in play situations and in class discussions.

12. Thomas, op. cit., p. 55.

Teaching strategies to foster language growth provided for free play, structured episodes, and individual teacher-child and small group interaction. Play opportunities were expanded, both in duration and in the supply of props, costumes and equipment for children's spontaneous exploration of roles and life-based activities or fantasized events. During the sixty to ninety-minute play period, the teacher worked individually with one or two children or with small groups of children in structured language practice activities. Before and after the play period, there were often total class discussions, regular music and dance periods, and other routine group activities. Milk and cookie snacks sometimes closed the play period, sometimes preceded it. Within this very flexible format, experimentation of many kinds went on.

Stimulating Children's Verbalization: Free Play

Children were stimulated to word and language growth in their free play as they drew upon interesting concrete experiences for new ideas, fresh information and satisfying content for their play. The teacher helped to stabilize word meanings and new vocabulary in her discussions with children, in the distinctive props provided for play, in her comments and evaluation after the play period and in the structured experiences which served to support and advance language progress made in free play.

For example, on November 2, at 9:10 a.m., just before releasing the class for free play, the teacher discussed with them their use of air transport uniforms and their dramatic play, which she had observed was extremely confused at this early stage. When she asked, "Does the pilot build the airplane?", many children thought he did, but a few said he "drives it" or "flies it." The teacher showed the class a detailed picture of the pilot and co-pilot in the cockpit, asking, "What are they doing?" "What's on his head?"

"He's speaking through a phonograph," Harry said. The teacher supplied the word "earphones," then pointed to the picture of the stewardess, to discuss her job title and role. A week later, the teacher used a book, Pogo's Jet Ride, to continue a class discussion of the work of the air transport

crew members. She showed the children pictures in this book of the stewardess buckling seat belts, demonstrating the use of an oxygen mask, and serving food to the flight crew in the cockpit and of events in the course of a routine jet flight.

Three days after the discussion of Pogo's Jet Ride, the following observation was made in the block corner during the free play period:

Four children in uniforms, having built a loose, large block structure to represent a plane, are now in it. The "pilot" wears a cap, the co-pilot wears a cap and flight jacket, and the two stewardesses wear caps and over-the-shoulder handbags. The two pilots, sitting side-by-side, keep turning a wheel mounted on a board.

"Only children who have tickets can go on the plane," the teacher reminds them, handing some tickets, that is, pieces of paper to the stewardesses. "Go get some passengers and fly someplace. Give out the tickets."

But the two stewardesses just sit, holding the tickets. The teacher calls them to her, asking, "What are these? What did I give you?" They tell her, "Cards."

"Yes, tickets," the teacher resumes. "Go give these to children, to be passengers."

"Which children?" the stewardesses ask.

"Anyone you want," the teacher replies. "Go give somebody a ticket. Give one to Joan so she can go on the plane. Give one to somebody else." Jane goes to the doll corner and hands a ticket to one of the girls.

Meanwhile both the pilots hold the wheel, "driving," saying "ah" and making zooming airplane noises.

Two "passengers" come from the doll corner, holding dolls and tickets, one in high-heeled shoes. They sit down in the plane area, passive throughout the dramatic play. The pilots continue to "drive," manipulating the wheel vigorously. They invite the teacher to ride with them but she says she will come in about ten minutes.

Two more girls arrive and want to get on the plane. The stewardesses say, "Tickets," and give the passengers tickets, who go to the teacher to show her their plane tickets.

"If you have a ticket, you can go on the plane," the teacher tells them. "No ticket, no ride."

However, the passengers go to the doll corner, then back to the plane area to return their tickets because they want to play elsewhere. The pilots chatter to each other in Spanish now.

"I'll take you to Mexico," one pilot tells the stewardesses, and both pilots continue to "drive" vigorously. One pilot leaves, then the other, while the four girls, two stewardesses and two passengers, sit quietly on blocks, unmoving and wordless.

This observation illustrates the way in which the teacher repeated vocabulary in context, gradually giving words meaning that conveyed little or nothing before, as "tickets" and "passengers" were defined above, as well as "stewardess," "porter," "mechanic," "baggage" and other terms on other occasions.

Immediately after their first trip to the airport, the information, vocabulary and action demonstrated in play took a sudden upward turn during the free play period. After several children had been called by the teacher for block corner play, Pedro said to Dominic, "I'll be a captain and you be a captain. We'll build seats."

Alfredo surveyed the block structure which was built to be a "plane" and criticized it. "It's too small," he said. Rows of "seats" (blocks), two abreast, contained no aisle.

Bud was critical, too. "It doesn't look like an airplane." He separated the seats and made an aisle. Four boys helped him, as they struggled to make their plane interior resemble the plane in which they had been allowed to sit the previous day, at Kennedy Airport. When they were satisfied, they chose their own roles. Pedro couldn't find the word "jacket" to describe his uniform and Dominic couldn't remember "pilot."

This observation indicates continuing struggle for words but complex content and rich detail are apparent in the seating arrangements, the job differentiation, discussion of food service, tickets, destinations, discussion of departure time, play concerning mechanical plane trouble and passenger acti-

vity on the plane. The children's direct experience on the Kennedy Airport trip triggered more detailed action in play, and conversation bubbled all over the block area and the doll corner concerning travel, tickets, and other elements of air transport. Verbal stimulation and more meaningful use of words was on the rise.

Structuring Elements in the Program

Discussions and Stories. Frequent total group discussions just before or a few days after a trip or new experience offered opportunities to use new vocabulary and express understandings. Often, after such discussions, the teacher retold the story to the class, injecting selected vocabulary. These stories were typed on a primer typewriter and duplicated. Some stories contained blank pages for children's own pictures; others were illustrated by the teacher for use as story clues. Finally, the teacher tape recorded the story so that four children could listen to it simultaneously through headsets while following the little booklet with its picture clues. Children enjoyed this activity, asking to hear the story again and again, turning the pages correctly, and often reliving the exciting experience with gestures and remarks.

Each week, a few children were invited to take home library books, with their standard language structure and good vocabulary, from the classroom collection, so that older siblings or adults could read a story several times to them. When a child returned his book the following week, the teacher requested him to "read" the story to the whole class. The teacher helped by supplying words freely or referring to picture clues as needed. Some children seemed to remember stories completely and used much of the author's phraseology and language.

Class Newspaper. Structured experiences included group efforts to compose stories for a class newspaper, based on direct experiences. An example of the children's verbalization of their trip to Kennedy Airport follows:

11

Teacher: If we do write the newspaper, what should we say?

Child: We went on a trip and we looked out and we saw some airplanes, and we went onna airplane, and the stewardess pull our tables down, an' we saw the stewardess, two stewardesses, and one captain, one pilot.

Teacher: Yes, that was wonderful. Yes we could write that in our newspaper. What else can we write in our newspaper? Bud?

Bud: (No response)

Teacher: Is there anybody else who can tell us what to write in our newspaper? Polly? You came on the trip with us, what else can we write in our newspaper? So that our Mommies will know what happened.

Polly: One day we went onna trip.

Teacher: To where?

Polly: At the airport.

Teacher: Do you remember the name of the airport?

Children: Kennedy.

Teacher: Tell her.

Children: Kennedy Airport (in chorus).

Teacher: And what else happened, Polly? How did we go?

Harry: On a bus!

Teacher: Yes, and then what happened? Alfredo?

Alfredo: We hadda go in a little down 'cause you take a ladder you hafta fall down.

Teacher: Down from where?

Alfredo: From de ladder?

Teacher: Where did we go down from, Renee?

Renee: From de door.

Teacher: From the door? Door of what?

Renee: From de door of de ticket clerk.

Children: We buckle up and then we sit down.

Teacher: Say it again, Renee.

Renee: We sat down and the stewardess buckled our seat belts.

Teacher: Yes, and who else did we see, Lydia? Stewart?

Stewart: The captain.

Child: Oh, I know we went out. We went out like we came in.

Teacher: What was the first thing we saw when we got off the airplane?

Child: A ladder.
Teacher: A ladder? And who was using the ladder?
Child: We saw the kitchen.
Teacher: Where?
Child: In the back of the airplane.
Teacher: Yes, there was a kitchen in the back of the airplane. And what do they keep there?
Food. For the people in the airplane.
What do we call the people in the, who ride...?
Children: Passengers (in chorus).
Teacher: Before we even went into the airport, we saw somebody who was working there?
Stewart: Was carrying the suitcases.
Teacher: Good. And what was he called?
Manuel: The porter.
Teacher: What does the porter do?
Child: Carries suitcases.
Teacher: He must be very strong to carry all the suitcases! Is he very strong.
Manuel: No.
Teacher: How does he do it?
Manuel: Puts it on somethin'.
Teacher: What's the something called? Do you know?
Child: A hand truck.
Teacher: Very good. Does he put the suitcases on the airplane?
Child: No.
Teacher: How did the suitcases get on the airplane?
Child: By the truck.
Teacher: And how do they get up?
Child: By the ladder.
Child: By the scale.
Teacher: What goes up into the airplane?
Child: An elevator.
Teacher: It was like an elevator. (More explanation: like an elevator that went right up to the door and that's how they get on.)
And the whole time we were there, we heard something. What did we hear?
Jane: The lady talking on the microphone.
Teacher: What was she saying?
Jane: How the airplane gonna go.
Teacher: How the airplane's gonna go? And what?
Jane: What time.

Child: What time it's gonna land.
 Teacher: And what else did she say?
 Child: What time it's gonna leave and what time it's gonna go and what time it's gonna land.
 Teacher: And she also told it so everybody could understand it.

On December 11, the teacher held another group discussion with the class about the airport trip. Based on their recall of the details with the addition of selected vocabulary, she tape recorded a composite story. The children made pictures for "covers" and took home copies of their story for parents to read, after "reading" it in class.¹³

Teletrainer. On January 7, the teletrainer was first made available for class use. It is a telephone kit which is provided for school use and includes two telephones on long cords and an instrument box with switches, to ring either telephone or to sound a "busy" signal.

The children were attracted by the novelty of the telephones, especially the switches and ringing bells. A large, shifting group waited impatiently for turns, and sometimes a child seized a telephone from another child but most of the children waited their turn. The manipulation and bell-ringing was constant, the conversation meager. When a child's turn came, he could not find anything to say, except, "Hello, who is it?" and "It's me." Lydia became impatient when she could not get a name from her telephone partner so she sent a friend out into the hall, where the second instrument was, to find out who it was.

The teacher's brief attempt to structure use of the telephones to play a game of "Guess What I Have" was quickly abandoned because the children were so carried away with the excitement of the telephone play. It was apparent that much more exploratory play by the children had to be scheduled before further structuring.

13. See Appendix D, for copies of stories written in class.

On January 20, the telephone kit was returned to the classroom for continuous use for the following month. Plans for its use included further time for children's free exploration, followed by gradual structuring of telephone language activities.

On January 21, about eight children, three to six at a time, played freely with the teletrainer kit. The following observation was recorded:

Joan said, "Hello, hello, can I talk to Bud?"

Bud snatched the telephone from Pedro and replied, "Hello, hello. You calling me? What you want? What you say?"

Joan said, "Is your husband there?"

"My husband! Husband!" Bud said, indignantly. "What you mean asking for husband? Are you crazy?"

"Oh, you got a wife?" Joan retorted. "Is your wife pretty? What's your wife doing? Is she kissing you? (Giggling) I bet she's kissing you."

"What you say that for?" Bud demanded.

"Let me talk to Pedro. Let me talk to Bud. Hey, who is this?" Joan shouted, above the noise of constant bell ringing by Maria.

"You gotta put it down. Now, you pick it up. Hey you talk," Maria directed.

Pedro now held the receiver, calling, "I can't hear nothing. (Much noise of telephone bell and classroom noises.) "Hello, hello. Put on Joan. Hello. Hello. Who's this?"

"It's me. It's Renee," said Renee, giggling.

"Is your husband big or little?"

Pedro turned to Bud, next to him, saying, "She talk about husband."

"Hello, honey bunch," Renee went on giggling. "This is your sweet wife. Did you kiss your wife? Hello, honey bunch." This was followed by much giggling from the girls and laughter and "you're crazy" from the boys.

Now Ginny held the receiver. "Hello, hello, who is this?"

Polly responded, "Who is this?"

"Speak up. I can't hear you," Pedro called.

Ginny's soft voice failed to carry and other children kept admonishing her to speak up.

"I'm coming home," Ginny was heard to say.
Stewart took one receiver, to say, "Hello, hello,
hello, hello. I can't hear nothing. Hey, talk!"
"Who's talking?" asked Renee.
"Who are you? This is Stewart."
"Hey, get off the phone," Pedro shouted. "Some-
body gotta talk. I gotta talk."

This type of spontaneous fun went on at considerable length as the telephone kit spurred children's natural, playful conversation in the next few weeks.

While the telephone kit's free use by children in play stimulated considerable conversation, so did free play in the block corner or the housekeeping area. The goal for the telephone kit, after its novelty wore off, was to structure practice activities to help children use new vocabulary and more standard forms of sentence structure and word usage. On February 11, the researcher set up a small table, three chairs and the telephone instruments near the children's clothes' cubbies, in an out-of-the-way corner of the room. By this time, with neither the bells nor buzzer working, the telephone instruments became props for the exercises, which were elaborated as follows:

The researcher gave Ginny and Maria, at opposite ends of the table, too far to reach across, a collection of small wooden objects representing animals, people, cars, buildings, and rubber figures of family members and community workers. One child dialed her instrument; the researcher struck a finger cymbal to stimulate the telephone bell, the second child picked up the telephone and, after greetings of varying lengths, requested an object in the other child's collection. Since the children could not reach across the table, words and pointing gestures were chiefly used but the pointing turned out to be useless as a clue. The researcher supplied names as needed, such as alligator, bull, cow or hippopotamus, called attention to the difference between cars and trucks, named colors, distinguished color shades when necessary and repeatedly furnished model sentence forms, such as, "What do you want?", instead of "What you want?" and, "Will you give me...?", instead of just naming the desired item.

The researcher instructed the first pair in great detail while other children looked on, impatient for their turns, prompting now and then. The onlookers mastered the rules of the game so well that it was unnecessary to repeat instructions to the succeeding players. Interest continued high for thirty-five minutes, and five children wanted second turns. Requests for objects used words to describe color, size, placement and function. Since the telephone instruments were no longer functioning, they seemed unnecessary for regular practice activities since toy telephones from the housekeeping area could serve the same purpose. An example of the verbal interchange, in this practice activity follows:

"Hello," said Enrico.

"Hello, what do y'want?" asked Bud.

"Want, want. . .car." Enrico replied.

"Very good," interrupted the researcher. "Say 'I want the car.'"

"This one?" asked Bud, picking up a blue truck.

"Truck. . .," said Enrico, pulling his red suspenders. "This."

"Do you want the truck that is the same color as your suspenders?" asked the researcher.

"Yes," said Enrico.

"Do you know the color of your suspenders?"

"What?" Enrico asked.

"The color is red," the researcher informed him.

"Gimme red, red truck," Enrico managed to say.

The researcher dist. lished between a truck and a car, which both boys seemed to understand at once.

"Now," said Bud, "It's my turn. I have to ask for something. I want that, next to the blue boy there."

"Tell Enrico more about it. He can't tell what you want," the researcher told Bud.

"I don't know what it is. It's that animal," Bud persisted.

"What color?" asked the researcher. "What does it look like?"

"Dis?" asked Enrico, picking up one object after another.

"It's like this," Bud said, pointing to his yellow block.

"Yellow" asked the researcher.

"No, not yellow," Bud said, "See, it's by the blue boy. No, not that, in back."

Pedro found it.

"That's called a camel. That's an orange camel," the researcher told Bud.

"Yeah," said Bud. "Orange camel."

After much work with individual children in such language practice games it was possible to let children carry on the exercises by themselves, if the teacher was careful to pair a more advanced with a less advanced child. Many new words were acquired and used in these language games.

Providing Opportunities for Children to Use Symbols

Pictures and Objects. Early in March, a research assistant was assigned to work with individual children, to practice naming and identifying objects and pictures. Her notes recorded the following results:

Ginny giggled, covering her face with her hands, and was unable to identify colors or to name them. Shown a red triangle, made of hardboard, Eduardo named its color correctly and said its shape was like a Christmas tree. Shown three triangles of different size, he named the largest "big," the smallest "tiniest," but was unable to describe the one of medium size. After Ginny heard Eduardo's responses, she was given another opportunity to name the red triangles and, this time, she was successful. She played with the triangles, making a "house with triangles."

Eduardo was able to point to a picture of a squirrel when asked to, but he could not pronounce it. When asked to name a picture of a tiger, he called it a lion. Ginny could not name the squirrel either, could not identify a hen, which she later called "a mother."

Pedro was able to name all the pictures correctly, except the hen. Stewart was unable to name the hen and the cow. Sam called the tiger a lion, but he knew that the mailman's job is to "bring letters." Wilfredo did not know what kind of food squirrels eat, nor could he name the policeman and mailman pictures.

Maria responded at first only with gestures but later she was willing to repeat the names the researcher gave her. She was able to identify colors correctly. She was tested by being asked to hand the researcher one large blue circle, one medium yellow square and one small red triangle and did so, correctly. She was then given the task to ask for specific geometric shapes, which she did.

Dominic had trouble distinguishing correctly the color names of red and green beads, although he could identify yellow, blue and orange.

These practice activities generally consisted of asking children to name pictures or objects or to point to those named, and to repeat the names they did not know, after which the child was again asked to associate the correct word and picture or object.

As the children's understanding of vocabulary grew, the teacher made wall charts, from time to time, with clear picture clues and names for words as baggage, hand truck, microphone, seat belt, earphones, passenger and flight bag.

Word Symbols. When the teacher was encouraging children to develop airplane play through trips and provision of appropriate props, she wrote signs for children to use in their play, to help them remember new words and to use them correctly. The airplane pilots' caps had "pilot" written on the visor; the ticket clerks had desk signs denoting "ticket clerk" and "reservation clerk." The children quickly associated the word with the correct sign, referring to signs, asking for them, trading them back and forth, getting them out for play from a special shelf, and returning them after play.

Names - Recognizing and Writing. Unlike most middle-class children who enter kindergarten with considerable prior practice at home, or in nursery school, in name recognition and writing, the children in the demonstration class could neither recognize nor write their names. The plans for the year included systematic work toward this goal, for several reasons, including the following:

1. Ability to write one's name is a concrete, visible skill which contributes to the child's own feeling of mastery, to his parent's appreciation of his school learning and to his present need in so many school situations to know and write his name;
2. Parents can readily understand and value this goal and, when a sample of the child's name as written in school is sent home, parental assistance is more likely to be forthcoming than for any other kind of learning, thus offering one kind of successful school-home partnership for a clearly-understood and valued goal;
3. The symbolism of the alphabet is an exceedingly useful symbol system for children to learn, along with other types of symbolism;
4. Children who could write their names were eligible for their own public library cards and, therefore, this skill could lead the young child to book sources otherwise closed to him and his family.

Work on name recognition began early in October when the teacher requested each child to crayon a self-portrait on manila paper. She hung these pictures on a wall, with her own addition of the child's name at the bottom. The pictures were of the crude, uncontrolled variety young five-year-olds tend to draw, but it was not important for anyone but the artist to recognize his own picture. Practice in name recognition was placed at milk time daily for several weeks. The teacher pointed to a picture and when the child rose who recognized his own drawing, it was his turn to get his milk carton from the milk tray. The teacher constructed two pocket charts for names, one for boys and one for girls, and, while the regular practice in name recognition was going on, children were encouraged to find their own name cards, to use as a model, in order to write their names on the pictures they painted and crayonned daily.

On October 21, at the first classroom conference with parents, the teacher gave sample name cards to a few parents who, she thought, were ready to help their children practice this skill at home. Soon, children were observed helping

each other find their names on the pocket charts. The teacher noticed, on October 27, children were imitating her work with them on names. Pedro was holding the pointer and pointing to the pictures with children's names and a group of children around him were responding to his questions, "Who's this? Who's that? Who's this?" Two days later, the teacher observed other children in the same activity. Apparently, they enjoyed this "game" enough to play it on their own.

On November 10, the teacher tested name recognition by covering all the pictures, showing names only, although these were in the same places on the wall in which they had been for almost a month. Name recognition was almost universal - only Jane had trouble. But few children could recognize names other than their own. The next day, the teacher chose four name cards from the pocket chart, just before free play time, announcing, "These children will play in the block corner." Thus, as regular practice activity on name recognition was discontinued, many practical uses were found for children's names, to help them apply their learning. Children sometimes played the "game" on their own, as a few children did on December 14 when Pedro held the pointer again and told his friend, Alfredo, "That's me, Pedro Verde, that's Harry, that's Alfredo." Then he tested Ginny, who also seemed to recognize many names, although she may have been recognizing the pictures or the picture and name, in association, and in its regular place on the wall.

It was very useful to the teacher to have most of the children increasingly stable in name recognition, since this facilitated record-keeping. Children were asked to make a check-mark on a list of names on the library shelf when it was their turn to borrow a classroom book for a week's reading at home, and in other ways.

When the teacher encouraged children to use their name cards as models to copy, she noticed that most children had considerable difficulty copying them. Early in January, as children began to role-play airport ticket clerks, additional functional uses for names and writing appeared. Bonnie, who was one of the most advanced children in the class in verbal skills, asked if she could play ticket clerk on January 8.

She was given a table with scissors, pencils and paper and she busied herself cutting paper and writing names. When Sam was ticket clerk on January 14, he did no writing but busily distributed "tickets." Children who played ticket clerk roles were given signs to wear with their job title, and as children sought these signs, wore them, swapped them and "read them," "ticket clerk" became another well-recognized combination of symbols.

Since so many children had difficulty writing their names, hardboard letters and printed letters inked on stamp-pads were provided, to give more children feelings of success, to increase children's interest in practicing with the alphabet and to help them learn to differentiate letters faster. The teacher would write a child's name on paper, then hand him the box of hardboard letters to match it, or suggest he match it by printing with inked stamps beneath the name she wrote. She quickly discovered that Eduardo, for example, had no left-to-right pattern, could not recognize or match individual letters and was equally satisfied whether they were upside-down or backwards. Pedro also wrote his letters backwards and upside down. Since the children had so little experience making such fine visual discrimination, or developing the needed patterns, it was clear that a great deal of individual practice was in order. At this point, the teacher asked each child to write his name. The results of this test gave the teacher needed information for subsequent individual work with children and thereafter she was alert to encourage those children who needed most help to practice or work with her.

On March 30, the researcher worked with Pedro and Eduardo, two boys who still had trouble writing names. Pedro tackled the task eagerly and completed it quickly, with practically no help. Eduardo needed a great deal of help but, once started, he worked doggedly and laboriously. He kept reversing his lower-case "a", trying to correct it and gradually succeeded. Other children asked if they could write too. Alfredo was adept, except for one letter, and as soon as a correct model was shown him, he copied it correctly. Sam whined that he couldn't make a capital "S", but when the researcher wrote one, he promptly copied it and wrote the rest of his name correctly.

The teacher decided to send home with each child another sample of his name, at the beginning of April, to encourage more name practice. Experience in working with individual children indicated that much progress was made which would not have occurred in group sessions, with one teacher to twenty-five or more children.

Early in April, children's recognition of each other's name was observed frequently. At clean-up time, Jane would notice a name card on the floor and call to Joan, "Hey, Joan, your name is on the floor," signalling Joan to put her card back on the pocket chart; or children would leaf through crayon drawings, reading correctly other children's names. Whenever the teacher used the name cards in a total group activity, a child who failed to identify his name because his attention wandered would be sharply reminded by several children that the card held his name.

Plans for a Mother's Day party at school in May included children's writing invitations to their mothers, for further practice and to show their parents their progress in writing. Each child was encouraged to copy the teacher's model invitation, which read, "Please come to the show," with the child's signature. As a few children completed their invitations, some children insisting on writing more than one, the teacher displayed these, stimulating other children to attempt the task.

Progress in name writing was more uniform for the total group than progress in any other goal. A major reason may be the clarity of the goal and the relative ease of developing ways to work with individual children to achieve the goal. Another important reason may have been the children's ready acceptance of this goal as relevant to school work and as status-giving, reinforced by parent assistance and support. Children's satisfactions in this skill were apparent even to the casual observer.

Providing Models

The teacher's own language provided the one regular, daily model of standard English speech to many of the children during individually planned as well as class activities.

The one-to-one relationship of teacher to child was nowhere of greater value than in assisting language growth through work planned for language needs of specific children.

For those children who had no one at home who read to them, the teacher provided tape-recorded stories which were especially useful in approximating a one-to-one relationship between teacher and child. But such children also needed someone to respond to questions, to repeat some especially delightful passage, or just to react in human terms to a shared experience. Obviously, the important affective stimulation implicit in close teacher-child relationships cannot be duplicated mechanically or in mass situations for young children. Optimum work with these children requires more than one teacher in each class.

Providing A Climate For Listening

A widely accepted teaching strategy, even though it may be more readily recognized under some other terminology, is that of providing a climate for learning. One familiar and highly prized condition of learning centers on the maintenance of a "listening climate" in the classroom when needed. The young child's ability to listen, at any given moment, is dependent upon numerous variables. Some of the most important ones appear to be, in addition to the teacher's skill in establishing a "listening climate," the intrinsic interest of the content and such personal variables as the child's relative freedom from hunger, thirst, bathroom needs, fatigue and emotional distractions. Practice activities to stimulate language growth, when carried out under good listening conditions, with content of high interest, seem to make considerable difference in the growth of children's attention span in task-oriented endeavors.

Daily listening experiences were scheduled in the demonstration class from the beginning of the year, as in most classes for five-year-olds. Often the teacher called the children to sit on the floor near her in a group. Sometimes, she conducted listening activities while the children sat at their small tables. Listening activities ran the usual gamut which included instructions, exhortations, threats of punishment for transgression of school

rules, explanations of forms and informative materials sent home to parents, directions for subsequent activities, reading books, telling stories or poems, sharing children's reactions or experiences and discussing recent or projected experiences.

Providing Materials For Learning

Audio-Visual Materials. New listening experiences were developed with the aid of audio-visual equipment and materials specially produced for the new curriculum. In this connection, the fine cooperation of a member of the Bureau of Audio-Visual Instruction and of the assistant principal of the school was particularly valuable.

Tape Recorder. The tape recorder, which was a permanent feature of the kindergarten equipment during the study, was in almost daily use. Teacher and children recorded stories, discussions, songs, children's retelling of story books and their descriptions of recent trips. After a child's story had been recorded, the group would listen to its playback breathlessly, then applaud vigorously at the end. The silence accorded the story-teller was usually a measure of appreciation of success in a difficult venture. The children caught the teacher's excitement and identification with their labored efforts and they valued this kind of achievement accordingly.

Following a special activity of frying plantains by the class as part of the recognition of Puerto Rico Day, the teacher tape-recorded the children's cooperative story about the event. On January 15 the tape was made available to four children to listen simultaneously through individual headsets. They sat on the floor listening with intense interest. One child said to the teacher, "That's you, Miss J." When the teacher put the flannel board and cutouts she had used to illustrate the story on the floor near the listening children, three of them began to manipulate the cutouts as they followed the story. Two children made gestures appropriate to the action in the story. The first

four children looked pleased as the story ended, so many other children asked for turns. Four more children were selected to use the earphones with the taped story. While no discussion followed the story, all the children indicated enjoyment of the individual listening experience.

Listening on individual earphones, at a time when the child requests it, has obvious advantages over total-class listening: free choice, high motivation satisfied, and lack of interruption and distraction from others. Children were able to capitalize on these advantages when, throughout the study, several other stories, based on exciting class experiences, were made available for use on the tape recorder with individual headsets.

Slides and Movies. In addition to considerable use of the tape recorder, telephones and teletainer, other audio-visual resources were provided to enhance language growth. Colored slides and eight-millimeter movies recorded scenes the children had visited on trips as well as their own play activities in the classroom. Extensive conversation was carried on between the teacher and small groups of children as they examined slides in table viewers and movies on a tiny rear view screen projected by a small, cartridge-fed projector. Usually there was intense excitement as the children identified themselves and their friends in the pictures and as they recalled stimulating experiences on trips and in the classroom.

For example, on March 30, the following observation was recorded while the teacher and children viewed some movies of their soup cooking and eating experience:

Teacher:	What's happening? What's in the pot?
Children:	Carrots, potatoes, onions. We're going to eat it.
Teacher:	What's coming out of the pot?
Children:	Smoke.
Teacher:	Why?
Children:	Because it's hot. It's hot! And on the bottom of the pot is beans.
Teacher:	And what's on top?
Children:	Carrots and potatoes.

Child: Carrots.
 Teacher: What else do you see? How do you know
 those are carrots?
 Child: Red.
 Teacher: It's orange. Carrots are orange.
 Child: That's blue.
 Teacher: Who is that?
 Child: Mrs. R.
 Teacher: What's Dora doing?
 Child: Stirring the soup.
 Teacher: Why do you have to stir the soup? What
 are you doing, Jane? Why is she stirring
 the soup? Is it hard to stir, or easy?
 Children: Easy!

The next movie showed some of these children at airplane play in the block corner and the following conversation was recorded:

Teacher: What's that? What do you call that?
 Child: That's the - uh - up the airplane.
 Teacher: That's the hard one you always forget.
 Teacher: What do we call that? Instrument panel.
 Teacher: What's that in the back?
 Child: That was the ticket clerk.
 Bud: I'm wearing the same shirt.
 Teacher: He's wearing the same shirt as he did that
 day.
 Child: There's paper on the table.
 Teacher: Why? I can't hear you, you'll all have to
 talk louder. What's that thing again you
 always forget?
 Children: Instrument piano.
 Teacher: That's close. Say, 'instrument panel.'
 Children: Instrument panel.
 Teacher: What's that?
 Child: Gasoline.
 Teacher: What's that, Bud?
 Bud: Gasoline. (They see a gasoline can in the
 movie.)
 Teacher: What's that?
 Child: Tool kit.

Teacher: Lydia, what's that? Maria?
 Maria: I don't know.
 Teacher: Yes, you do. What's this? (Noise.)
 Child: That's Jane doing this so the light won't
 get in her eyes.
 Teacher: What are the children doing?
 Child: They're on the table.
 Teacher: What does the sign say, Maria?
 Maria: Ticket clerk.
 Teacher: Ticket clerk.
 Child: And that's a clock.
 Teacher: What are these?
 Children: The names! (They see the name pocket chart.)
 Teacher: Whose?
 Jane: Of the children.

After more of this, the conversation continued:

Teacher: Everybody can't talk at the same time because
 then we'll just hear mumble-jumble.
 Children: Mumble-jumble.
 Child: I see my own self. I see Renee.
 Child: I see Renee and Lydia.
 Teacher: What are they doing?
 Child: I see Maria in the dollhouse.
 Teacher: Who is she?
 Child: She's a passenger.
 Child: I see Jane.
 Child: I see Joan.
 Teacher: What are the children in the doll house doing,
 Stewart?
 Ginny: Putting clothes in the suitcases.
 Teacher: Why?
 Child: Go to the airplane.
 Teacher: Oh, where do you think they're going?
 Children: They're going in the airplane. (Noise.)
 Teacher: Where do they go?
 Child: They get tickets for the airplane.
 Joan: If you don't get tickets, you can't take a
 ride.
 Teacher: Look what's happening in the block corner.
 What are the boys doing there?

Child: Putting the seat belts. (Noise.)
 Child: That's me and Mary.
 Teacher: What are you doing? (Noise.)
 Child: To the telephone. (Noise.)
 Child: They were getting names.
 Child: That was you, Miss J. You just went by
 there and back over.
 Child: He's taking the suitcases.
 Teacher: What's he called?
 Children: The passenger. The pilot.
 Teacher: Oh, what's Rico doing?
 Child: He's weighing the baggage.
 Joan: He's the porter.
 Children: He's the porter.
 Child: He's the passenger.
 Teacher: Who is the passenger?
 Child: Rico.
 Teacher: Is he the passenger?
 Children: (Shout) No!
 Teacher: And who else is the porter?

This conversation went on at length because these movies had just been developed and were being shown for the first time. Interest remained high for a long period as the children repeated the same film sequences several times, while the teacher pressed them to verbalize names and to describe the action they remembered well, as it was shown in the movie. On many days subsequent to this first showing, the teacher offered movie viewing of these film loops to those children who were interested. The teacher would often sit with four or five children, questioning them and helping them practice verbal description and naming, as illustrated above.

Since trips are too expensive to be duplicated with any frequency, movies and slides served to preserve the data for leisurely and repetitive exploration in class. Each time the children viewed these pictures, they remembered or shared more detail, acquired more information about the pictures from the teacher and from other children, and practiced using new words and descriptive language. Translating their experiences and understandings, that is their concepts, into language helps children to carry forward their thinking processes and to terminate the thought sequence in a successful or re-

warded overt response, according to Carroll.¹⁴ When the teacher can help children experience success and mastery in school, she has forged a powerful strategy for motivating children's learning.

Summary

A variety of activities and experiences contributed practice in vocabulary building, in fluency of communication, in learning forms of standard English sentences and in expressing orally affective and esthetic feelings.¹⁵ Considerable language emphasis centered on:

1. Naming and labelling airplane job titles and functions, activities and objects used in connection with air transport.
2. Naming colors, geometric shapes, comparative sizes, foods, pictures commonly used in children's books such as animals, community workers and family members.
3. Practicing standard sentence forms in asking for objects and responding to requests for objects.
4. Practicing conversational style on telephones.
5. Describing intensely interesting experiences on trips and in classroom activities such as cooking or making movies.
6. Retelling stories from books.

14. John B. Carroll, Language and Thought, Englewood Cliffs, N.J., Prentice-Hall, 1964, p. 111.

15. See Appendix C for examples of language practice activities.

7. Composing newsletters for parents about classroom activities and trips.
8. Practicing language skills in a one-to-one relationship between child and adult.

Critical Analysis of Language Teaching

There were some obvious strengths in the program developed to advance verbal skills as well as some weaknesses. Stimulating verbalization through personally exciting experiences inside and outside the classroom served to generate the "spontaneous" activity in self-education which has been prized so highly by early childhood educators. All of the informal activities and the structured practice activities were productive learning experiences.

To overcome some of the weaknesses, language teaching could have been improved by the following:

1. More variety in trips in the immediate neighborhood and the use of these experiences to generate additional vocabulary and syntactic work in the classroom in informal and spontaneous learning episodes. Carroll notes that, in working with bilingual children to achieve second-language learning, "...a faster, more appropriate kind of learning can be attained by shifting the balance in favor of 'informal' learning."¹⁶
2. More regularized practice activities, more systematically pursued. While the children's individual language needs were pinpointed early in the study, there was never any regular patterning of practice activities. Spontaneity and impulse, rather than preplanned practice, governed the day-to-day, weekly and monthly programs. Continuity was seldom achieved,

16. John B. Carroll, Language and Thought, Englewood Cliffs, N.J., Prentice-Hall, 1964, p. 43.

except by chance, in children's practice activities. Agreeing that structured learning should be held to a minor segment of the child's kindergarten experience, the researchers are convinced that these practice activities, of short duration, can be highly productive only if they are planned and implemented in a well-organized pattern.

3. More personnel to assist the teacher in regularizing practice activities.
4. More specialized materials and equipment to achieve the needed individual practice. Makeshift materials and varied pictures and objects are helpful, but these should supplement materials which could be planned to meet the specific types of needs listed in this study.

CHAPTER VII

The Teacher and Teaching Strategies

The teacher of the demonstration kindergarten class was the same one who had participated in the pilot study during the previous spring semester. She had been selected on the basis of a recommendation by her principal as a successful, certified early childhood teacher with five years of experience teaching kindergarten classes in deprived neighborhoods. Her continued willingness to participate after her experience in the pilot study indicated her confidence in being able to work in close cooperation with the two researchers. She did not feel threatened by having the researchers and research assistants in the classroom with her a great deal of the time. Valuing creativity in teaching, she was enthusiastic about trying a new program.

Working Plan

Weekly conferences were regularly scheduled with the teacher during school hours. Both researchers attended most of the meetings but occasionally they alternated. Plans were made for carrying on the project, ideas were shared, and continuing evaluations were made in terms of children's needs and progress. Specific plans were evolved from assessment, in terms of the goals of the study. As problems emerged, they were dealt with during these meetings. It was a period in which to identify material and equipment needs and to make arrangements to secure them. Copies of minutes of these conferences were made for the researchers and the teacher.

In addition to directing the project, the researchers acted as assistant teachers at times. They assumed major responsibility for securing special materials for classroom use, in addition to serving as resource personnel to the teacher. They had no supervisory relationship with the teacher, nor did they represent the employing organization in any way. The relationship with the teacher represented one of assistance, demonstration and co-planning and co-implementation, devoid of critical, judgmental, supervisory aspects.

Conferences were held as needed with the principal, assistant principal, Spanish coordinator, audio-visual coordinator and teacher. In the beginning, the principal attended weekly meetings. Throughout the study, meetings were attended by personnel other than the classroom teacher on the average of once a month. These expanded meetings were useful in facilitating the project, particularly in scheduling, in arranging for "other teaching personnel" to release the teacher for conferences, for assisting in plans to extend contacts with parents, and for securing valued cooperation and expertise in the use of the audio-visual materials.

The researchers conducted and supervised the testing program and were responsible for the gathering of observational and tape recorded data. The teacher was encouraged to keep her own records, for her own teaching purposes and for more complete data than the researchers could amass on their scheduled visits. It was hoped that if the teacher would keep observational records, it would afford her more perceptive analysis of the educational events in her classroom, and would help her change her teaching behavior.

General Problems

There were some general problems which one would anticipate in a project which required the teacher to change her style of teaching. Even after the pilot study, these problems remained. A major hurdle was the project's requirement of a curriculum determined by key concepts in major disciplines. This curriculum basis was not familiar to the teacher, nor was it understood at this stage.

The teacher was also faced with the problem of working out a completely new schedule, unlike the one she was accustomed to. Instead of planning and initiating a new "center of interest" weekly, or bi-weekly, she was expected to engage in long range, continuous, developmental programming. Her concern at not "covering" the syllabus of the New York City Board of Education for the kindergarten did not abate until the year was almost over. She questioned relinquishing many familiar activities related to various holidays which had previously constituted the core of her curriculum. She found that art and activities related to those holidays were being crowded out of her program. And, during the early part of the year, she felt that the children were missing the benefits which they might have gained from her unusual emphasis on music and dance. However, as time progressed, she was increasingly skillful in coordinating much of her music program with the aims of the project, particularly as it related to concept development in the value of cultural pluralism. As she began to understand the new program better, she saw that no important kindergarten activities had to be sacrificed.

Under any circumstances, it is difficult for a teacher of twenty-five active young children to find time to keep observational or anecdotal records. It must be remembered that, unlike grade level teachers, the kindergarten teacher works daily with 2 classes - if she kept faithful records, she would be recording data on at least 50 children daily. But, when anecdotal recording is not a part of the teacher's behavioral pattern, as it apparently is not for most kindergarten teachers, the task becomes even more difficult. This was the case of the demonstration teacher. She preferred to jot down a note occasionally, to remind her to make a verbal report to the researchers during a conference. Observational records require specific skill, as well as time, and the researchers assumed their own records would furnish helpful models to the teacher. Since the teacher did not use these models, it can only be deduced that lack of time contributed to disinclination to keep systematic records.

There is always a certain degree of strain for a teacher when other professionals watch her teach. When other persons spend from two to four days a week in the classroom, the

teacher is bound to be affected by their presence. The teacher also found it necessary to accommodate to the testing schedules of the researchers. Under these conditions, what was surprising was the teacher's ability to accept the strain involved and to respond with remarkable acceptance and spontaneity. She was able to retain her composure throughout the year and to express her feelings frankly. But the problems which arise from participation in a project which makes continuous demands on a teacher should not be minimized, no matter how stimulating it may be in the long run.

Planning With The Teacher

The demonstration project benefited from the pilot study, especially because the same personnel were involved in both. The pilot study had made it clear that more emphasis and ingenuity were needed in developing working relations with parents of the kindergarten children. Preliminary plans made in the pilot study facilitated an early start on the demonstration project at the beginning of the school year.

Planning For Parent Support

Plans were made during the first month to prepare a questionnaire for parents, to determine which times would be most convenient for parent meetings. As a result of information gathered, a meeting date for the following month was set.

When plans were completed the following month for a group meeting with mothers, efforts to increase the possibility of parent attendance and successful communication with parents, included:

1. Arranging for the Spanish Coordinator to attend the meeting as interpreter, because more than half the children came from Spanish-speaking homes.

2. Preparing a meeting notice, and repeating its message to parents when they brought or picked up children, which urged them not to stay home because there was no one to care for younger children, but to bring them to the meeting.
3. Duplicating a sheet of suggestions to be given to parents and to be discussed at the meeting on "How to Help Your Child in School."
4. Arranging to show films to the parents which were taken during the pilot study, to illustrate the project's plans for the coming year with their children.

Another plan which involved parents was to initiate a book-lending program, so that children's interest in language and ideas would be encouraged through their sharing school-owned story books with their families at home. In addition, class mothers were to be invited to assist in communication with parents by contacting other mothers in their neighborhood, particularly those who had been unable or unwilling to come to school meetings. School messages and suggestions were to be circulated in this way.

Plans For Classroom Activities and Materials

The initial topic or area of study, that of air transport, had been agreed upon by the teacher and researchers. A skeleton curriculum was developed which included, as guidelines, sub-concepts related to the main social science and mathematics concepts of the study. Lists were made of props, play materials and equipment that might be useful in developing these sub-concepts. Preliminary plans were formulated for trips and in-class experiences that had potential for realizing the stated educational goals.

Books about air transport were to be read and discussed with the children. At the same time, uniforms, such as pilot's hats and stewardesses caps, and other suggestive play materials

such as earphones and microphones were to be available to them. Efforts were to be made to secure a section of a real airplane instrument panel, to stimulate dramatic play. Mathematics games and other games that might be useful in language practice were selected and ordered.

Other plans included decisions to write a newsletter for parents, to develop special activities for Puerto Rico Day, to devise a system for collecting pennies for eventual purchase of books at the school Book Fair, to test children's ability to read their own names, to make a symbol system for taking attendance, a symbol chart for listing regular responsibilities in the room, and a symbol system for a few familiar songs. Some of these plans were not followed, as indicated below, but most of them were.

During the third month, on the basis of the children's growing involvement in air transport interests, many more props seemed desirable. The instrument panel, which had been secured, was to be put into the block area. A steering wheel and seat belts were to be made for dramatic play. Mothers were to be invited to sew flight jackets for the pilots and coveralls for mechanics from material and patterns which the teacher had secured. Small airplanes that could be used for table play were to be purchased. Small, substantial suitcases and dress-up clothes, particularly for men, were also to be provided.

As it became evident that plane building was hampered by limited space in the block corner, a decision was made to re-arrange the adjacent area of the room. The teacher was to look for indications that airplane play had taken a fairly clear direction, at which time she was to initiate brief five-minute-discussions during which the children could describe their play, focusing, particularly on role identification.

Plans For Cultural Pluralism Study

Detailed plans were made for Puerto Rico Day, scheduled for mid-November. These events were to be included in a story by the teacher, to be recorded on tape for later individual and small group listening by the children on individual head sets attached by jacks to the tape recorder. A newsletter to parents was to include children's own reports on the events of Puerto Rico Day as well as other activities of interest to the children. Gradually, additional plans were made to use music and food experiences to further the children's understanding of cultural pluralism.

Trips

Arrangements were made for a trip to Kennedy Airport just before Thanksgiving. The particular focus of this trip was to be on jobs involved in air transport, their names and their functions. Special attention was to be paid to the captain, co-pilot, stewardess, mechanic, ticket clerk and baggage handlers. The teacher's role was to initiate and carry on conversations with children, name objects and raise questions. It was decided that after the trip, which was followed by a school vacation, the teacher would refrain from any discussion about the trip but that she would wait for children's leads, for feedback, before building further on the experience of the airport trip.

Further Plans

A teletrainer was made available to the school by the telephone company and certain periods for kindergarten use were arranged. In the early stages, children were to be free to manipulate the kit without direction before structured games between pairs of children would be developed.

Continuing to work on symbols, the teacher was to test to find out how many children could write their names. This test was simply a request that each child write his name, to the best of his ability, on a piece of paper furnished by

the teacher, on a particular morning. She was also to work out a system of distributing cookies on a regular basis for the set of children at one small table which might seat one, two, three, or four children. Opportunities were to be sought for practice in one-to-one correspondence in routine settings.

Plans For Major Goals

Early in December, an extended conference of the researchers and the teacher laid plans for major teaching goals for the next two months. Conceptual emphasis was to revolve around clearer definition of air transport jobs, including those of ticket clerk, porter and mechanic. To encourage this, a "ticket office" was to be set up with appropriate signs, materials for making "tickets" and reference charts of names and numerals in the area. A hand truck, suitcases, tools and a tool kit, hoses and "tanks" as well as aluminum food trays were to be made available for dramatic play.

Symbolization was to receive attention through the use of number symbols and names on tickets, weather symbols on weather charts, the use of maps and a globe, and, perhaps later, a seating chart for airplane passengers as a device for matching children and seats in one-to-one correspondence.

Language growth was to be fostered by relevant vocabulary introduced by the teacher and class discussions to clarify and practice vocabulary and meanings. A class newspaper reporting the events of Puerto Rico Day and the trip to Kennedy Airport through children's stories was to be prepared before Christmas, to be written in both English and Spanish so that all parents might read the children's reports.

The researchers planned to conduct a brief inventory of children's mathematics concepts, the results of which were to provide guidance for work with individual children in terms of their needs in this area. The teacher was to incorporate some practice in matching sets and determining "more or less" in relation to specific small numbers as it fit naturally into her routine of distributing rhythm instruments during certain music periods.

An important step in the planning was the evolution and statement of a general direction of teacher guidance, as follows:

1. Teacher notes children's confusions and conceptual needs from observing and listening to their play.
2. Teacher reminds children of information that they have already gathered on trips, etc., and in other ways, and helps them to see more roles they can play or more functions of the roles they are playing.
3. Teacher offers props which suggest new roles when she thinks children are ready to move into new activity.
4. Teacher offers symbols as she sees children ready to understand them. These may be pictures, numerals, written words, maps and others.
5. Teacher plans follow-up discussions to help children clarify their understandings and practice new vocabulary.
6. The teacher's object is to foster children's autonomous, spontaneous play and drive to learn, not by drill but by furnishing needed experiences, manipulative materials and needed vocabulary.

In January, a second trip to Kennedy Airport was planned. In response to the information gained from the mathematics inventory, it was decided that individual work in this area would be carried on with the seven children who scored lowest. Games were to be devised for use with the teletainer which had been in the classroom long enough to satisfy the curiosity and manipulative interest of the children. Samples of children's ability to write their own names indicated the advisability of finding ways to help certain children gain skill and interest in this task.

Assessment And Further Plans

The following month, an assessment of the study resulted in decisions as to where to place the major focus in terms of the learning goals established at the beginning of the project. Special consideration was to be given to:

1. Further work with parents.
2. Name recognition and ability to write names.
3. Reading books to children and opportunities for children to "read" these books.
4. Extending vocabulary.
5. Coin recognition and some knowledge of money values and equivalences.
6. Symbols other than words such as numeral recognition, use of arbitrary symbols, map symbols, weather symbols.
7. Cultural pluralism through food experiences and the arts.

The balance of planning for the final months of the study were devoted to implementing and assessing the effects of the decisions listed above.

Development of Teaching Strategies - Implementing Plans

An important teaching strategy to help children toward concept and language growth was the teacher's guidance of children's play activities. This required considerable change in the general teaching behavior of the teacher. Changes in the teacher's behavior included such teaching modes as:

1. Observing children's dramatic play closely, to gain information about their interests, confusions, problems and understandings. This change required the teacher to circulate among the children during their free play period, listening to and noting the play, instead of sitting at her desk doing clerical work or preparing art materials for another day's program.

2. Role-playing in some relevant part of the children's dramatic play, to stimulate them to more fruitful play without dominating and determining the course of the play's development. For example, when dramatic play about air transport in the block corner first took some semblance of organization, the teacher played the role of a passenger briefly, sitting with other children who were playing passenger roles. The teacher requested specific services from the child playing stewardess, who was very vague about what her duties were supposed to be. When the teacher requested a pillow, so she could take a nap, or some coffee or food to eat, or help to adjust her seat belt, she suggested functions for the stewardess and content for the passengers and crew which helped the children's play to utilize meaningful material which gave considerable impetus to their dramatic play.
3. Furnishing factual information in a context in which it is useful and relevant to children's dramatic play. For example, when tickets were introduced into the play pattern, and the teacher was invited to be a passenger, she replied that she did not have a ticket. The children's activities in providing the needed ticket revealed their misconceptions about the relation between tickets and travel. The teacher's factual statements about this relationship, while role-playing a passenger and fitting her part into the children's play, resulted in furthering their interest and involvement in "ticket clerk" activity. As this activity became a significant and valued element in play, it became better understood and more clearly reflected reality.
4. Furnishing stimulating and relevant props at strategic moments when their use could suggest new play possibilities to children. For example, when the porter's job began to be explored in detail, after an airport trip, and children began to pretend blocks were suitcases, the teacher offered the use of several small suitcases which were being held in

reserve until they could be used meaningfully. Subsequently, the teacher borrowed a small bathroom-type scale from the nurse's office, so the children could elaborate the play further by weighing suitcases.

However, the teacher tended to use the new strategies very little, until very late in the academic year, when she began to understand them better. Earlier, her strategies were often limited to issuing directions before play began, or stating limitations to be observed while play was in progress. Probably, no one was more amazed than the teacher when she began to grasp the many subtleties of the new strategies and to try them out, as the study entered its final months.

Structured Discussions and Stories: Use of Guided Recall

Stories and discussions, a regular part of a kindergarten program, were often related specifically to the social studies content of the project. The teacher was particularly skillful in reading and telling stories and the children generally listened, engrossed. The discussions that followed these stories were generally conducted on a question-and-answer basis with many repetitions of the same question by the teacher. The children tended to respond to these questions by trying to guess the expected answer.

About half way through the study, the teacher began to change in her conduct of these discussions. She began to inject reference to children's earlier experiences, as, for example, their trip to the airport, and to have them recall relevant information and observations as the basis for solving problems. This type of guided recall was effective in initiating the ticket-making activity for airplane play, in determining the needed materials, and in suggesting the information that was useful on passenger's tickets.

On several occasions the teacher made up her own stories about the real experiences of the children in the class. She also prepared artistic flannel board figures which were then used by the children to make up stories for the class with the encouragement and support of the teacher. These popular figures were also available to the children for independent play and story-telling.

Use of Class Library Books: Children "Read"

Early in the year, the teacher instituted a "library" system in which she allowed a few children to take a book from the room library and keep it at home for a week. The parents were requested to read the book to the child, several times if possible, before he brought it back. Then children were asked to "read" the story to the class by referring to the pictures, with the help of the teacher. This proved to be a very effective procedure with some children, but, for some reason, it was dropped. Later in the year it was resumed. The feature which heightened the children's responsiveness was the procedure of recording their stories and playing them back. It was not unusual for one child to gather a few friends together for the purpose of "reading" to them during the play period. A similar interest was developed for music books and children would leaf through a book to find a particular song, usually by a picture clue, and they would sing together.

Discussions to Prepare For Trips: Purposeful Excursions

Several trips were made by small groups of children for the purpose of marketing for the class. Accompanied by one of the researchers, they took short trips to a grocery store to buy ingredients for baking cookies for the mothers' party, to a Spanish bakery to buy majorca bread for the Puerto Rico Day party, and to an Italian produce market to buy vegetables for making soup. Each of these trips was the occasion for the children to report to the rest of the class on their experience, naming the objects purchased and using descriptive vocabulary to recapture the fresh experience.

In preparation for the two trips of the total class to Kennedy Airport, the teacher conducted discussions intended to focus on the purpose of the trip. The purpose of the first one was to observe and gain some information about various people who work at the airport and the nature of their jobs. The second trip was to focus on the work of the ticket clerk and the process of handling baggage. Following these trips during which still and movie films were made, the children had many opportunities to discuss their trips to recall and interpret them while viewing the transparencies or the short films in cartridges.

The teacher was particularly conscious of the importance of these structured discussions in fostering children's language growth by increasing their vocabulary, by clarifying and building sub-concepts related to the topic of the study, and by increasing their use of Standard English.

Although the teacher had been accustomed to taking trips with children throughout her teaching career, she was now asked to change her usual pattern of planning and managing trips. Consistent with the goals of the study, trips were planned, not to initiate a topic, but rather to serve as a source of information to clarify children's misconceptions as revealed during their discussions and play around a particular subject. It was intended to sharpen perceptions, to gather new information in a meaningful setting, and to stimulate further exploration of important, related ideas. It was considered desirable to revisit a location, such as the airport, to help children further solidify their beginning concepts, to refresh earlier impressions, and to extend their perceptions into areas which would be useful in deepening their understandings of the topic. For example, from the first trip, children gained much information about the work of the captain, the stewardess, and the physical characteristics of the inside of a jet plane. From the second trip, because of careful planning, their interest was extended to the process of handling baggage and to the activities of the ticket clerk. The teacher recognized the effectiveness of planning trips with well-defined purposes in mind when she saw how the understandings gained from each trip were later integrated into some complex and precise dramatic play activities by the children.

Another new element, introduced into these trips, was to arrange to include one adult for four or five children, to encourage frequent verbal interchange between children and knowledgeable adults. In this way, important elements could be pointed out and useful questions could be raised by the adults in close contact with a few children. However, the teacher found some difficulty in sharing her responsibility with so many other adults. She expressed concern at not having complete control of the total class for which she was, in fact, professionally responsible.

Discussions After Trips: Guided Vocabulary Practice

Although the teacher did not accompany the small groups of children on the various shopping trips, she prepared them for the trips in much the same way as for the airport trips. Upon their return, she guided the children as they reported on their ventures. On these occasions, the researchers acted as assistants to the teacher by taking the children marketing, carrying out structured activities such as cooking vegetable soup, frying plantains, and baking cookies. They also developed language games for use with the tele-trainer and other materials, and interviewed children for the content of the newsletter.

The teacher gathered material from the children's discussions for use in interesting stories. They revolved around children's experiences in cooking chocolate pudding, making Italian vegetable soup, and frying plantains. These she had typed and duplicated so that each child might have his own illustrated story. She also recorded these stories on tape so that children could listen to them in groups of six with earphones while following the story in their own books. The teacher was enthusiastic about the effectiveness of using children's experiences as the basis of recorded stories that could be savored over and over again with little supervision by the teacher.

Variety In Teaching Number Concepts

In exploring ways of helping children develop mathematics concepts, plans were made to incorporate work with numbers in various ways. Opportunities were sought to utilize classroom routines, structured games, play, and incidental activities to further children's understandings of simple mathematics concepts.

In introducing number practice into the daily routine of milk and cookies, the teacher utilized her table seating arrangement in which half the children were seated at each of two table clusters. A child was expected to count the number of children at his table cluster which might run as high as thirteen on days when all children were present. On this basis he was to secure enough cookies for his group. It was immediately evident that most children could not fulfill this expectation, even though some of the children could count by rote to twenty. A subsequent revision of this routine which required children to secure cookies through one-to-one correspondence of a small group, numbering no more than four at any individual table, highlighted the difficulties which many children had at this level of competence. This routine was followed for several weeks with growing skill on the part of the children. Then the teacher reverted to her previous pattern of clustering tables, only to find that most of the children were, again, completely confused. It was quite a surprise to her to realize how much repetition is required before the concept of three or four is stabilized in most children.

In the subsequent work which the teacher did with individual children, following the games and activities constructed by the researchers, the teacher gained a deeper understanding of the number and variety of experiences which children require in order to develop an understanding of numbers. She developed a degree of ingenuity and flexibility in helping children grow in number concept, on an individual basis.

Toward the end of the project, the teacher demonstrated increased sensitivity to the opportunities for including work in mathematics quite incidentally in relation to other activities. Such occasions were matching sets in the distribution of new crayons, counting the number of sunny or rainy days in connection with calendar work, counting records that had been brought to school by children, and the collection of five pennies or a nickel from children to cover costs of cookies which were to be baked by the children for their mothers.

Teaching Skills of Symbolic Representation

One of the objectives of the project was to demonstrate how kindergarten children can be helped to develop efficient learning strategies utilizing various forms of symbolic representation through selectively structured experiences and play activities. The teacher had, in her previous teaching, placed relatively little emphasis on the use of symbols. However, she was very quick to see the utility for present and future learning in children's ability to read and write their own names. It was necessary to build a bridge between children's recognition of their names when attached to their own portraits of themselves and their ability to write their own names in manuscript form. As the study progressed, the teacher found many ways to incorporate practice in name recognition in routines which involved milk distribution, play assignment, identifying individual stories, signing invitations, identifying individual calendar weather charts, and dismissal. As air transport play developed and ticket clerks became an important role, need to identify and write names and numbers were utilized.

The same problems were experienced in structured activities with symbols, such as clocks and calendar weather charts, as with mathematics. In each situation it was found that children were unable to respond effectively or correctly, because teaching began at too advanced a level. When the procedures were simplified and clarified by the researchers, the teacher was able to structure activities more appropriate to the children's levels.

Because the researchers recorded classroom observations at frequent intervals, the teacher had access to direct assessment of the process of children's learning, which teachers rarely have. This feedback made it possible for the teacher to see how often she tended to move ahead too quickly and to assume that children had learned concepts, which in fact they had not. This feedback also made it possible to analyze the children's learning problems and to return, when necessary, to simpler learning goals and to recording progress of individual children before offering more complex learnings. However, problems remained in developing good classroom techniques of recording progress for individual children for specified conceptual learnings.

In the area of music and dance through which the teacher structured activities intended to help children extend their understanding of cultural contributions of ethnic groups, the teacher's strategies required only one important change. Her program had always been strong in these arts. Problems arose, in the early months of the demonstration program, from the feeling that she was spending much less time in these areas of the curriculum than usual. Eventually, this concern was eliminated as the program developed more balance, with more time for music and dance. The one change introduced in the music and dance teaching strategy was to broaden the goals and the learnings for these activities, adding conceptual growth to appreciation and skill growth.

Assessing Work With Parents

The experiences of the pilot study underlined the need to make substantial efforts to develop closer contacts with parents in order to enlist their help in furthering their children's education. Notice was again taken of the importance and difficulty in working out effective procedures for cooperative relations with parents. The original questionnaire which was to be used in kindergarten registration, to give the teacher a basis for planning meetings

at the convenience of parents, turned out to be ineffective. Parents, for the most part, were confused by it. The teacher, then, made an effort to gain this information personally from parents, with the help of the Spanish co-ordinator. Efforts of this type are valuable and essential but unless they can be well coordinated by the school leadership personnel, in a well organized plan with adequate staff, a great deal of well-intentioned effort can be fruitless.

The first meeting was attended by mothers of almost half of the children. The project was explained briefly and slides of the pilot study were shown. Requests for two or three class mothers netted at the time, only one mother volunteer. The teacher stressed the importance of mothers' talking with their children about school, answering their questions, reading books which children might bring home from school or discussing pictures in such books. Although plans called for regular meetings of mothers, only one other such meeting was scheduled toward the end of the study. Individual conferences on school time, which were part of the regular school program, were held twice during the year. At these conferences the teacher shared information with parents about the program as well as about the child's progress.

Several parents cooperated readily on special projects, such as sewing attractive cloth uniforms for air transport play, acting as resource personnel on Puerto Rico Day for frying plantains, and helping on one of the airport trips. They responded to requests for small sums of money for shopping needs. As reported by the children, many of the parents read the kindergarten newsletter, although not always to the children, as had been suggested. Parents, generally, encouraged children and helped them practice writing their names at home by following the sample name card which the teacher had furnished. This was a practical measure to avoid having children practice writing their names in all upper case letters.

The attendance at the final party for mothers was very good. Several mothers and grandmothers brought neighbors and relatives to help translate for them. In-

fants and younger siblings were much in evidence and were truly welcomed by the teacher. The teacher's sincerity in suggesting that mothers bring younger children to meetings and conferences rather than stay home because of family responsibilities was apparently sensed by the parents and this information was shared among them. The parents seemed to be very appreciative of the special educational attention which their children had received and expressed it warmly to the teacher.

In assessing the work with parents, it can be said that there had been some extension of relations between them and the school, but the anticipated development in this sphere did not occur. The principal explored the possibilities of mobilizing out-of-school community leadership to work with the school's parents and the beginnings of a program was on the horizon by the end of the year. A fine nutrition program was also arranged by the principal to which kindergarten mothers were invited. A further step would require the school's initiative in serving the special needs of kindergarten parents. This may well be the most important parent group in school, especially for those who are entering a first child in school. At this entering grade, parent expectations and experiences with school personnel may have lasting effects on parents' subsequent relationship to school personnel.

In evaluating the program in February, the researchers noted the infrequency of parent contacts. They suggested further work with parents, such as scheduling another morning parents' meeting, sending weekly newsletters to parents on class activities, and sending short bi-weekly letters to parents about each child's progress and items of particular interest about the child. However, only the plan for the parents' meeting was carried out in the form of a Mothers' Day Party, due chiefly to the lack of time and personnel.

Summary

The previous sections of this chapter and data analysis of earlier chapters that refer to teaching strategies indicate the extent and nature of changes in the teacher's functioning. The experimental curriculum was substantially different from the one she was accustomed to. Her style of teaching as recorded in observations had changed to some extent during the demonstration project. The nature of change in her teaching behavior may be shown as follows:

<u>Previous Teaching Strategies</u>	<u>Changes in Teaching Strategies</u>
Vaguely defined learning goals for children	Clearly defined learning goals for children
Curriculum content derived from syllabus	Curriculum content derived from key concepts of disciplines
Spontaneous planning	Increase in regular planning without discarding spontaneity
Short range planning	Long range planning giving direction to short range planning
Question and answer as principal forms of discussion	Increased use of problem-solving as basis for discussion
Non-participant, incidental observer of children's play; active primarily as disciplinarian	More involved in children's play as basis for observing their educational needs; stimulating richer play; assessing play as basis for future planning
Spontaneous trips	Goal-oriented trips

Previous Teaching Strategies

Primary responsibility for total class management on trips

Ingenuity in providing materials for children

Directive in ways that children are to use many new materials

Many class activities guided by teacher

Evaluation based on impressions of children's understandings, growth, and problems

Incidental guidance with symbols and language development

Much incidental teaching

Planned, rare, practice activities

Some help for children to express new ideas and experiences

Changes in Teaching Strategies

Greater use of parents and other adults on trips to enhance value of trip for individual children

Ingenuity in providing materials for children consciously directed toward particular learning goals

More opportunity given for exploratory manipulation of new materials before structuring occurs

More small group and individual activities guided by teacher

Evaluation based more on data and planned observation

Planned, structured and incidental guidance with symbols and language development

More clearly developed patterns of teaching as: identifying problems, seeking information, allowing time for self-structured play, directing discussions, role-playing, further play, posing new problems, etc. Incidental teaching more goal-oriented

Rarely planned practice activities indicated by identified deficits

Considerable help for children to express new ideas and experiences

<u>Previous Teaching Strategies</u>	<u>Changes in Teaching Strategies</u>
Short blocks of time in scheduling	Long blocks of time in scheduling play activities
Some independent choices of tasks by children	Increased opportunity for independent choices of tasks by children
Much teacher-made materials and some audio-visual prepared materials	Considerably more teacher-made materials and specially prepared audio-visual materials directly related to learning goals

Of special importance, however, were the teacher's own feelings about her work. She felt that her teaching strategies during the demonstration were substantially different from those of previous years. She felt that she had grown considerably as a teacher and in her understanding of the teacher-learning process. She anticipated continuing to explore this new way of teaching and of sharing her growing understanding and enthusiasm with her kindergarten colleagues during the following year.

Problems Related to Teaching Strategies

However, some of the specific problems encountered in the process of bringing about change in teaching behavior presented serious obstacles to achieving the purposes of the study. Such problems included a variety of teaching strategies which could not be achieved, it turned out, except through very gradual changes of the teacher's understanding and conceptualization of teaching.

In guiding children's play, the teacher had previously learned to be highly directive, or involved only to the extent that disciplinary measures were needed. This view of teaching was consistent with supervising children's play while seated at her desk engaged in routine responsibilities.

or in the preparation of materials for future lessons. In the early stages of air transport play, therefore, she required children to build an airplane structure before they could wear the popular uniforms of crew members. It was obvious to the children that there was some premium on air transport because considerable attention was paid to it in discussions, in generous provision of props and play materials, and in special events, such as trips, related to the subject.

A more open-ended view of teaching was developed in conferences. It was suggested that children should feel free to build anything they liked with blocks, and that they should not be required to build planes. At various times throughout the study, children became involved in building houses, zoos, boats, and other structures. Then they would return to air transport as the dominant theme. However, it was not unusual for one or two children to build small block structures independently or in pairs along the more dominant airplane structure.

The teacher found it difficult to supervise the play period in a way that expressed interest and enthusiasm for the subject which the children were exploring in play or that helped them clarify and solve conceptual problems which they encountered. She tried to help children see how their play roles could be extended. However, because this was generally done in a discussion before children engaged in play, it took on a quality of directiveness that it might otherwise not have had, if, instead, this help had come at a particularly apt moment in their play, or at the end of the play period. As the study progressed, the teacher began to grasp this subtle strategy and to intervene in play without taking it over.

Another problem arose from the nature of the discussions which the teacher held with the group. These discussions were considered as having high potential for leading children toward the selected goals. Perhaps because the teacher had considerable facility in capitalizing, on the spur of the moment, on an idea which had been discussed in previous conferences, her discussions were some-

times very fruitful. But the general pattern of these structured periods was a question and answer format, with the teacher often repeating a question several times in order to elicit similar answers from several children. Interchanges among children or open-ended discussions, rather than "correct" answers, began to develop late in the study. The teacher was still working to express appreciation of children's responses, instead of offering critical judgments, late in the study. This is another example of a subtle strategy difficult to acquire quickly. Teachers who have freely expressed criticism of young children can not be expected to divest themselves of this habit overnight.

A teaching strategy which received considerable attention by the researchers and the teacher concerned the need to individualize instruction and to work with one child or with small groups of children while others were productively engaged in independent play. For a long time, none of the suggestions by the researchers for group or individual work with children seemed to fit the teaching style of the teacher. Recognizing that a plan which the teacher, herself, might work out would have a greater chance to be used, it was decided that she would develop and test a plan for one week aimed toward daily work with a small group of children. Many possibilities were explored with her. For example, she might choose to work briefly with two groups on a particular day and with two others on the following day. She might plan to circulate for certain periods among children engaged in ticket office play, then among those engaged in the housekeeping area, then work with children and books or the tape recorder.

The teacher tried to evolve a plan for working with small groups of children during play period. She reported, however, that she found it difficult to follow her plan for special attention to math activities or language emphasis activities on a scheduled day, because she preferred to be more spontaneous. Instead she decided to list four or five activities and to try to include any one of them into the teaching day as the situation suggested. She intended to

keep a record of the activities and the children who had been involved in this individual work on a particular date, but this plan was not carried out at this time.

Toward the latter part of the project, the teacher did develop strategies for working with individual and small groups of children. The factor which seemed to bring about this change was the participation of the researchers in such activities during play periods. It should be noted that much of this work revolved about language activities, mathematics, and practice with symbolic representation. It may have been easier for the teacher to engage in a newer pattern of teaching when it concerned activities which had not, previously, been a part of the kindergarten curriculum. It is noteworthy, however, that as soon as the teacher viewed the researchers' demonstrations of this desired teaching strategy, she was able to develop a very competent model herself.

Some of the difficulties which the teacher encountered resulted from a tendency to try to move children too quickly from one level of understanding to another, as illustrated in her work with mathematics or symbols which was described earlier. An underlying problem here must be recognized as the degree of understanding of the structure of a subject which teachers have achieved or are willing to acquire. Some teachers may become motivated to increase their understandings in specific content areas. Otherwise, the school must find ways to encourage inservice education in content areas, either in school or in cooperation with local universities.

Although the teacher was deeply involved and interested in the demonstration project and the opportunities which it gave her for exploring new ideas in teaching, it was puzzling that she was apparently not stimulated to read current educational literature. The researchers are aware that teachers are generally seen as missing opportunities to become acquainted with current thinking in the professional literature and urge some creative efforts to improve this situation.

Implications For Teacher Education And Re-Education

The results of the demonstration project contain some implications which might be explored in further studies. In leading a teacher to develop more effective teaching strategies, the use of key concepts within various disciplines as groundwork on which to build the curriculum holds considerable promise. When these key concepts are suitably translated, so that the teacher can find channels that are of high interest and importance to kindergarten children, the teacher can readily find guidelines for curriculum elaboration. From this follows selection of materials, activities, and experiences that will be relevant to educational goals for disadvantaged children. When learning goals are thus grounded in a curriculum which evolved from key concepts, the teacher is free to explore, with children, many topics or areas of study leading to beginnings of these concepts.

New Direction in Teaching

Teachers of young children must somehow be assisted to recognize the complex process and the long period required to develop dependable concepts. As teachers become aware of the rich potential significant concepts offer for program development, they can be expected to use such material in increasingly skillful teaching. They can also become more attentive to children's conceptual growth and more alert to the deficits which require continued planning for more effective teaching. As a result, teachers may be relieved from the pressures to "cover" topics or subjects, since these will be seen as among many channels leading toward long range educational goals.

Instead of feeding children information, without regard to its impact on their understanding, teachers will have to be more concerned with individual children's confusions and inadequacies. Teachers, who use these newer strategies, gearing their curriculum plans to the children who comprise the group each year, will develop variety rather than repe-

tition in their teaching patterns. Keeping constant, as guidelines, the educational goals based on key concepts, teachers will have to vary all other curriculum components, to match the needs and capacities of the children in each succeeding class.

Guiding Play Activities

Another implication stems from the idea that teachers can play a more active role in guiding children's play activities. Teachers of early childhood have been cautioned against being over-directive in children's play activities. They have, however, frequently interpreted this to mean that they must be completely withdrawn during this period of the school day unless serious conflicts or high noise levels occur. They have traditionally permitted play activities for limited periods, but they have been reluctant to utilize play experiences fully. Thus, an important period in kindergarten education is often omitted, when the teacher can be more active in helping children solve problems and in being a source of information for children who otherwise do not perceive adults as such a resource. During play activities, a teacher can challenge children to a more complex level of play and to greater curiosity and inquiry about their environment. She can encourage growth by recognizing children's progress and small achievements. It seems clear that teachers can take a more active role in stimulating, challenging, and supporting children's learning through play without violating basic principles of child development.

Potential of Structured Activities

The demonstration program suggests the need to explore further the role of structured activities in the kindergarten as another way of learning. There are several implications about the nature of these structured activities. In the first place, they must be conceived in terms of the needs of specific children. In most cases, their effective

use depends upon individual or very small group interaction with the teacher. Eventually, carefully paired children can benefit from their use, but the teacher must know the capability of individual children in the areas of knowledge or skills involved. Games, practice activities, and discussions between a teacher and one or two children for short periods may, in the long run, prove to be a more efficient use of time and more effective teaching than more traditional methods. But more effective teaching also requires reducing kindergarten class size, providing more adults for individualizing instruction, and re-examining the proportion of time spent in housekeeping and routine matters compared with time spent in the more productive aspects of teaching.

Models For Language Growth

It is important that teachers utilize more fully their potential as models for the use of standard English in the classroom, to improve language skills of disadvantaged children. It is important, within the context of our democratic multi-cultural society, that standard English be viewed as a school language which has value in attaining success in school and in a broader community of educated people. At the same time, there must be no devaluing of a mother tongue other than English or another English accent.

Intellectual Stimulation

Another implication is a re-emphasis of the unique responsibility of the kindergarten teacher to develop a curriculum which has maximum potential for the intellectual growth of the particular youngsters who comprise the group, no matter how little equipped they may be to respond to conventional school programs and requirements. There are those who say that children will learn if teachers will teach. This humanistic appeal to the person-to-person commitment, which everyone can support, leaves unsolved the extremely complex problem of matching teaching and curriculum to the learner.

Teachers may acquire helpful ideas from clinical studies which usually reflect results in narrowly circumscribed situations. But the limitations of clinical findings are quickly recognized when these are applied to field situations of unselected groups within the realities of life in the school. Hence, it is only the teacher who can balance the many elements which characterize school programs. The teacher must determine the distribution of structured and unstructured activities, the ways in which new materials and ideas are introduced, the time allowed for exploration and discovery, the nature of teacher guidance, or the opportunities provided for revisiting and extending experiences. Functioning in this professional role requires the teacher to secure from the children in her class the bench marks and the feedback necessary to the development of efficient teaching strategies for these children.

New Media

Teachers can make more effective use of some of the newer technology which is now available to them. They may search out, or prepare, audio-visual materials that have special importance for their children. These may be photographs, slides, movies and tape recordings in which the children, themselves, are participants or which present materials with which disadvantaged children have a high sense of identity. In order to utilize these invaluable materials, they must be available to the teacher without long-term reservations. Investment in equipment that will handle films or tapes in cartridges and which children, themselves, control is highly recommended. Various effective ways of using these materials can be further explored. More extensive use of high quality teacher education television tapes and kinescopes as well as programs developed directly for children is also indicated.

Outreach to Parents

The advantages to the child of having the school enlist the cooperation and assistance of parents in the beginning stages of schooling are self-evident. Young children rely strongly on the values of the home which they, naturally, ac-

cept as their own. Therefore, if by intelligent and meaningful contact with parents the school can help strengthen a bond of cooperation between them, the parents can reinforce and support educational aspirations and values in their children.

The teacher, alone, cannot accomplish this purpose. The school needs to be viewed as one agent in the community working together with others for mutual benefit to children and their families. Professional workers in related areas could function as a team, supporting each other with information and service. Adequate health, social service, and mental health personnel are needed to assist parents and teachers improve the chances for a satisfactory life for their children. The school in its position as a center in the community can be a place where parents can learn more about raising their children, dealing with their problems and their unrealized potentials. Interests of parents as adults can also find a channel for fulfillment in the school, whether they be related to improved home management, consumer education, facilities for sewing and home decoration or mending, or for extending one's own educational and cultural experiences.

A more imaginative use of the school plant and greater flexibility in scheduling is necessary if the school is to offer maximum service to the community. It may be wise to explore "checkerboard" schedules to accommodate those parents who work in the daytime, those who work at night, those with heavy family responsibilities of younger children, and those who can be free only when older children are available to assume some responsibility. We question the standard closing of schools over the week-end when they might be of valuable service to the community. The plants can stand more intensive usage. But more effective use requires additional staffing by persons representing a wide variety of competence, including translators where language may be a barrier between the school and the home. Schools can apply knowledge gained from recent community development experience which has uncovered a source of strength in indigenous and potential leadership within the community itself. Shared planning and leadership within the community can give a much needed forward thrust to the education of disadvantaged young children.

In conclusion, perhaps the most encouraging implication to emerge from the study is the one which underscores the kindergarten years as fruitful ones for reversing the downward trend of success for disadvantaged children and for emphasizing the key role which the kindergarten teacher has in accomplishing this potential to some extent.

CHAPTER VIII

Conclusions

The curriculum developed to engage the young child in productive education must have several components. Its design reflects a balanced view of the child as a thinking, feeling, moving, growing and developing human being. It recognizes that he has a history, a family context, a community milieu with its values, rewards and aspirations within the broad context of contemporary America. It inevitably includes content of ideas, of intellectual stimulation and skills and behaviors. In addition, specific and varied teaching strategies are required for the implementation of the curriculum.

The major finding of this study may be that the single most productive teaching strategy, for disadvantaged kindergarten children, is the selection of very specific goals toward which to plan.

Findings

The selection of specific content goals was singled out as the major strategy for productive teaching of disadvantaged five-year-olds because this strategy triggers a rational approach to curriculum development and enables the teacher to move along clearly-discerned paths. It requires the teacher to make decisions on the shape and pattern of projected learning episodes, to differentiate the needs of a heterogeneous group of children, to find appropriate experiences and materials and to evaluate progress more systematically than has been usual.

Key Concepts as Kindergarten Learning Goals

Specific content goals can obviously be selected in many ways. In this study, the selection of a few key concepts from selected disciplines proved rewarding and fruitful, as it had in some previous studies with privileged kindergarten children.¹ If "big ideas" can be analyzed into some beginning understandings and conceptualizations, as many researchers are finding they can be, the teacher has the advantage of striving toward clearly-stated content goals which will be significant for the child throughout his life. The importance of working toward significant goals lies in the challenge to the teacher to develop an approach to learning in children which is not casual, trivial or superficial. Since the teacher can perceive that these goals are worthy of her best efforts, she may be able to project their significance in her teaching.

In this study, the researchers selected the key concepts and developed the sub-concepts, which became the learning goals. Such goals could also be selected and developed by a school staff committee on a grade level or representing the early childhood grades in the school. Developmental variation among children suggests the need for much variability in learning and the need for successive approaches, at succeeding grade levels in increasing depth and complexity. Once selected, goals will probably require analysis, clarification, specification and redefinition with teachers. Many teachers may require in-service courses or university study in content areas and in newer conceptualizations of disciplines.

Work With Parents

It can readily be seen, in observing classes of disadvantaged young children, how great a need there is for pro-intellectual school attitudes, to help overcome attitudes in these communities which may be non-intellectual. It is

1. See Helen F. Robison and Bernard Spodek, New Directions in the Kindergarten, New York, Teachers College Press, 1965.

obvious, however, that family progress must accompany the young child's advances, if the latter is to be supported and encouraged. If the school can only alienate the young child from his family and community through educational progress, much less will be accomplished than should or could be accomplished and some of the achievements will be destructive to the child in his most primary relationships.

Thus, the study suggested ways of involving parents and families in the school's plans for the young child's progress but, for lack of time and funds, mere beginnings were made in this direction. Suggestions for further involvement of families and community appear below. Here, it can be emphasized that some family cooperation was secured in the study in meaningful ways which need considerable expansion and development. Examples of fruitful cooperation with families, in this study, include parent meetings in the classroom without children; parent meetings and visits to ongoing classroom sessions, with babies and younger siblings invited and encouraged to attend; work with the school's parent coordinator for closer and more realistic types of communication with parents. Other instances describe ways of enlisting parents' assistance in meeting classroom curriculum needs, such as sewing costumes and uniforms for children, assisting in class trips and in-class cooking experiences, and supervising "homework" in helping the child learn to write his name. There were effective ways of sharing, with parents, specific ways to support the child's school education and of accounting for the school's work with the children through teacher-family discussion, through samples of children's work and through illustrating the school's program with slides and eight-millimeter movies.

Work with parents in the study may be summarized as arranging meetings and visits in school, enlisting parents' support at home for school projects, both in preparing materials and in helping the child practice a needed skill, enlisting parents' help in school in classroom projects and achieving a high degree of communication in detail on the school's program for these children.

Role of Structure in Kindergarten Curriculum

Another major finding relates to "structure" in the kindergarten program. This very ambiguous term, used in endlessly different contexts to mean many different things, is here being used in the sense that it has been traditional in the education of young children to plan programs with as little "structure" as possible. This includes avoiding specific content goals, refraining from direct instruction, and, generally, giving the child the responsibility for considerable self-selection in activities and materials, at least during free play periods.

This study suggests, as have other studies, that structure may be desirable or undesirable, for specific children, for specific goals, for specified kinds of learning. For example, it was found early in the exploratory study that, for children who had such great needs in this area, good language development and verbal skills were most unlikely to develop out of generally unstructured classroom experiences. Without some structured language experiences, it was futile to expect these children to pick up needed skills by chance.

Similarly, it became apparent that unstructured programs held little likelihood for developing some of the basic concepts which these children lacked. The study explored some very productive classroom teaching strategies which provided for considerably less structure, where it appeared unneeded, as well as for much more structure as required to attain specified goals. The uses and possibilities of some kinds of structure were explored in a context in which structures were eliminated which could not be seen as serving needs. As a result, much less total group activity, or "inactivity," was conducted and much more purposeful, individual-oriented or very small group-oriented work was programmed.

It may sound disappointingly trite to say that the great need for truly individualized teaching has yet to be well supplied in the kindergarten. The public schools may have to increase the ratio of teachers to children in kindergar-

tens, especially for disadvantaged children, but it will have to be clear that what is projected is a purposeful team able to reach more children, alone or in twos or threes, for specific kinds of teaching. Nothing will be gained if the only change is more personnel, who take turns in total group teaching and who use free play periods to turn their backs on "play" in order to complete clerical work at their desks. Some public schools are experimenting with smaller classes of young children and added teachers and these may be ready for considerable advancement in truly individualized teaching.

Another important finding of the study is the need for much more systematic experimentation with new technology and materials for classroom learnings. A sophisticated approach is especially needful, so that schools do not substitute formalism and machine programs for human judgment and approval, but make use of technology wherever teaching and learning can benefit. If teachers can be encouraged to continue their developmental approaches to children's learning while being supplied with better tools for precision in diagnosing needs, selecting practice activities, guiding children's learning and evaluating the results, it may be possible to improve kindergarten teaching without dehumanizing the school and its provisions for the young child.

Conclusions Concerning Curriculum

The kindergarten, in addition to prekindergarten classes where these are available, must take the major responsibility for the school's efforts in improving the disadvantaged child's oral-aural language skills. This task grows in size the more deeply it is explored. Much greater collaboration among scholars from different disciplines will be required before classroom teaching can be counted upon to result in needed improvement. More classroom-oriented research is greatly needed, with early and wide sharing of procedures and results from a variety of imaginative pro-

grams. Language problems are now defined with sufficient precision so that the infinitely more difficult avenue can be opened to the discovery of really reliable and effective teaching strategies or methodologies. Some of the specific conclusions or insights from the present study are summarized below.

Language Teaching

Spontaneous activity in children's self-education continues to be a prime goal for teachers of young children and need not be regarded as incompatible with many other goals and teaching-learning strategies which can contribute to the child's motivation and ability to advance his own learning. Where language needs are substantial, such systematic and well-organized practice activities appear to be necessary. Practice and structured teaching need not, however, be formal and group-centered. With adequate personnel and materials, it seems possible to develop very effective teaching strategies which can be highly individual and child-centered.

The kindergarten can continue to accentuate informal teaching-learning situations. The study suggests many ways to increase the time the individual child can spend in informal, meaningful learning, by more precise program planning and by eliminating much meaningless "group" time and trivial preoccupation with craftsmanship of many kinds.

More specific and focused planning for children's language growth could lead to more continuity in improvement and to more progress toward goals now regarded as largely unattainable. For example, the analysis of children's language samples taken early and late in the study, indicated very little change in the children's rate of grammatical errors per sentence. A large source of error was found in this study, as in others, in children's ability to handle forms of the verb to be appropriately. These findings should be suggestive of some of the specific goals of planning for language improvement in the kindergarten.

Mathematics Teaching

Conclusions about language teaching apply equally to teaching children beginning mathematics concepts, especially in regard to supporting and facilitating children's play with well-planned structured practice activities, which should not be formal. The researchers found, however, the need to foster the initial exploratory and manipulative play by which the child begins to shape his concepts perceptually and in sensory experiences, and to feature the maximum amount of play opportunities for each child before structuring learning and practice activities. Children's play was seen as essential to their own developmental progress in shaping concepts and in using teacher guidance and materials. Play was also a prime source of feedback to the teacher on children's conceptual growth.

The researchers found great value for children in practical application of math learnings to social situations, to woodworking, to classroom routines and in other ways. It seems important to plan more opportunities, even for the kindergarten, where children can synthesize their understandings through practical use. Incidental learning, it appears, should not be neglected but should be featured whenever appropriate, since this usually offers much more motivation and excitement than planned practice activities as well as unique opportunities for reflection and synthesis.

It was found that children's manipulative play with materials which may foster learning could be greatly increased through provision of a variety of "didactic"-type or self-correcting materials which are sufficiently attractive to stimulate children's voluntary practice-play. The study produced examples of children's intuitive leaps through such voluntary manipulation as well as the children's need to verbalize their discoveries, with the teacher's help. It was seen that children with language deficits, in order to make the same amount of progress in math learning, need more teacher support and guidance than more privileged

children. Again, unlike more privileged children, these children required a great deal of individual and group teaching to learn standard math symbols and, even more important, to begin to understand the nature of symbolization, that is, that arbitrarily-selected symbols may stand for things or ideas.

Social Science Teaching

The study confirmed findings in several other recent studies that young children find significant content absorbing and, when their learning experiences are appropriate to their learning styles and skills, they sustain interest over long periods of time in such material.

The study showed that children's sustained interest and work on specific concepts and areas of study is reflected in increasingly complex and realistic forms of dramatic play, in conceptual growth evidences in play and in verbalization, and in increased understanding and ability to use unconventional as well as conventional symbol systems. The children's study of some significant social science concepts, therefore, contributed to their increased comprehension of these concepts, as well as increased ability to use symbols to gain, store or use information and ideas. The children showed many signs of their growing pride and enjoyment in these abilities.

Children's study of the concept of cultural pluralism, it was felt, contributed to improving their own self-concepts, to projecting a more democratic image to parents of the school's valuing of all ethnic and racial groups and contributed intensely interesting music, dance, language and food activities to the program. Well-planned teaching-learning sequences of this type can be seen as very helpful to minority or underprivileged children in overcoming a sense of inferiority and in learning really democratic acceptance of unlike groups in the population. Attitudes which help children to value their parents' foreign language while studying school English are constructive and helpful to the child, the family and the school.

Conclusions Concerning Learning Strategies

The study offered support for the researchers' expectations that children would improve their learning strategies as they gained better language skills, more stable beginning concepts in mathematics and social sciences, and in science as well, and as they improved their understanding of and skill in using symbolic representation. In a school experience where teaching strategies are determined by clearly defined goals for kindergarten children, it appears that the children will develop attitudes and behavior that enhance their learning strategies. They are likely to accept challenge, to explore and discover, to persist in tasks which lead to new learnings, to utilize the teacher as a resource for learning and to seek status as a school learning person.

If they can be helped to substantial progress, in kindergarten, in these basic learning strategies, major deficits could be wiped out. Instead of failing early, as is the case with many disadvantaged children, they may adapt more successfully to the school's symbol orientation with greater possibility for academic success. Even with such achievement in kindergarten, however, much more must still be accomplished in the primary and elementary grades if early gains are not to be nullified or reversed.

BIBLIOGRAPHY

Almy, Millie and Chittenden, E., "Young Children's Thinking: Understanding of the Principle of Conservation," presented at the Biennial Meeting of the Society for Research in Child Development, Berkeley, 1963.

Beilin, Harry, "Learning and Operational Convergence in Logical Thought Development," Journal of Experimental Child Psychology, in press.

Bruner, Jerome S., On Knowing, Essays for the Left Hand, Cambridge, The Belknap Press of Harvard University Press, 1962.

-----, The Process of Education, Cambridge, Harvard University Press, 1960.

-----, Toward a Theory of Instruction, Cambridge, The Belknap Press of Harvard University Press, 1966.

Bruner, Jerome S., "The Course of Cognitive Growth," American Psychologist, vol. 19, no. 1, January 1964, pp. 1-15.

Burke, Henry R., "Raven's Progressive Matrices: A Review and Critical Evaluation," Journal of Genetic Psychology, vol. 93, no. , December 1958, pp. 199-228.

Carroll, John B., Language and Thought, Englewood Cliffs, New Jersey, Prentice-Hall, 1964.

Deutsch, Martin P., "The Disadvantaged Child and the Learning Process," in Passow, A. Harry (ed.), Education in Depressed Areas, New York, Teachers College Press, 1963, pp. 163-167.

Fast, Irene, "Kindergarten Training and Grade I Reading," Journal of Educational Psychology, vol. 48, no. 1, January 1957, pp. 52-57.

Flavet~~l~~, J. H., The Developmental Psychology of Jean Piaget, New York, Van Nostrand, 1963.

Gage, Gerald E. and Naumann, Theodor F., "Correlation of the Peabody Picture Vocabulary Test and the Wechsler Intelligence Scale for Children," The Journal of Educational Research, vol. 58, no. 10, July-August 1965, pp. 466-468.

Gray, Susan W. and Klaus, Rupert A., "Early Training Project: Interim Report," George Peabody College and City Schools, Nashville, Tennessee, November, 1963.

Hoffman, Martin L. and Hoffman, Lois Wladis (eds.), Review of Child Development Research, New York, Russell Sage Foundation, 1964.

Horn, Thomas D., "Basic and Applied Research Proposal," Resubmission of Proposal #3095 to the U. S. Commissioner of Education under the Provisions of Public Law 531, The University of Texas, Austin, Texas, August 4, 1965.

Hunt, J. McV., Intelligence and Experience, New York, The Ronald Press Co., 1961.

Inhelder, Barbel and Piaget, Jean, The Growth of Logical Thinking from Childhood to Adolescence, New York, Basic Books, 1958.

Karplus, Robert, "One Physicist Looks at Science Education," in Passow, Harry and Robert Leeper (eds.), Intellectual Development: Another Look, Washington, D. C.: Association for Supervision and Curriculum Development, c1964.

Loban, Walter, The Language of Elementary School Children, National Council of Teachers of English, NCTE Report no. 1, Champaign, Illinois, 1963.

Piaget, Jean, Judgment and Reasoning in the Child,
New York, The Humanities Press, 1962.

-----, Logic and Psychology, New York, Basic Books,
1960.

-----, Play, Dreams and Imitation in Childhood,
New York, W. W. Norton Co., 1962.

-----, The Psychology of Intelligence, Paterson,
New Jersey, Littlefield, Adams, 1947.

Robison, Helen F., "Learning Economic Concepts in the
Kindergarten," Doctor of Education Report, New York,
Teachers College, Columbia University, 1963,
typewritten.

Robison, Helen F. and Spodek, Bernard, New Directions in
the Kindergarten, New York, Teachers College Press,
1965.

Spodek, Bernard, "Developing Social Science Concepts in the
Kindergarten," Doctor of Education Report, New York,
Teachers College, Columbia University, 1962,
typewritten.

Taba, Hilda, Thinking in Elementary School Children,
San Francisco State College, San Francisco,
California, 1963.

Thomas, Dominic, "Oral Language Sentence Structure and
Vocabulary of Kindergarten Children Living in Low
Socio-Economic Areas," Doctor of Education Project,
Detroit, Wayne State University, 1962.

Vernon, Philip E., "Ability Factors and Environmental
Influences," American Psychologist, vol. 20, no. 9,
September 1965, pp. 723-733.

Wann, Kenneth D., Dorn, Miriam Selchen and Liddle,
Elizabeth Ann, Fostering Intellectual Development
in Young Children, New York, Teachers College Press,
1962.

White, Robert W., "Motivation Reconsidered: The Concept
of Competence," Psychological Review, vol. 66, no. 5,
1959, pp. 297-333.

APPENDIX A

KEY FOR SCORING WORD DEFINITION TEST

- 3 - synonym, recognizable definition
- 2 - function
- 1 - partial description, relevant association
- 0 - incorrect, no response

Jet

- 3 - airplane, plane, machine that flies
- 2 - it flies
- 1 - goes fast, makes noise, has wings
- 0 - incorrect, no response

Hangar

- 3 - shed for storing airplanes
- 2 - stores airplane
- 1 - a building
- 0 - incorrect, no response

Pilot

- 3 - man who drives the plane, man who flies the airplane
- 2 - flies the plane, drives the airplane, to fly the plane
- 1 - goes in airplane, a man
- 0 - incorrect, no response

Control Tower

- 3 - center on airfield from which airplanes are directed
- 2 - tells pilots what to do
- 1 - building
- 0 - incorrect, no response

Refueling

- 3 - filling tanks on airplanes with gas or fuel
- 2 - makes planes fly, gives plane power
- 1 - gas, it needs more gas, power, oil, put it in airplane
- 0 - incorrect, no response

Loading Baggage

- 3 - placing suitcases on airplane to be transported
- 2 - put suitcase, carry clothes
- 1 - suitcases, clothes
- 0 - incorrect, no response

APPENDIX B

Mathematics Inventory Test

Each child was tested individually by one researcher, using a box of colored cubes which are standard equipment in most kindergartens. Many of the children in the class had played freely with these cubes, it should be noted, throughout the September through December period before the test was first administered. Children continued to play with this material when the researchers were not using it.

Counting. The researcher gave the box of cubes to the child and requested the child to give her first one cube, then three, then two, and so on, varying the numbers through ten cubes, encouraging the child to count whenever the child did not appear to be counting the cubes selected from the box. For children who counted correctly through ten, further requests were made to 15 or 20, to gauge, to some extent their ceiling numbers, but since children varied in their interest and ability to sustain attention for this activity, no scores were applied above 10, other than to note the child exceeded this ceiling item.

Grouping. The researcher selected cubes from the box, first one, then four, then two, again varying the groups selected from the box, up to 10, requesting the child to recognize the size of the group. Most of these children found it necessary to count when more than one or two cubes constituted the group or set. This was not discouraged since no comparable data are available as to norms for grouping for children of this age group, or even as to the extent of group or set recognition without counting among children or adults generally.

Sets, equality and inequality. The researcher selected unequal sets, equalized them, selected larger unequal sets and equalized those. Sets used were through 5 and also 9 and 10 and 10 and 10.

Scoring. All scores were either 0 (incorrect) or (correct). No response was scored 0. One credit was assigned for each check. Raw scores totaled a maximum of 10 for counting, 10 for grouping and 10 for sets, or a combined total maximum of 30.

APPENDIX C

Examples of Language Practice Activities**A. Naming, labeling, matching pictures**

Duplicate sets of pictures, of animals and of people, cut out of inexpensive picture dictionaries and stapled to cardboard for long wear, were used in several ways.

1. Teacher and child each have a set of pictures. They take turns naming pictures, the teacher readily supplying any name which the child does not know or is uncertain about. With the Spanish-speaking children, the teacher did all the initial naming, as teacher and child turned over similar pictures. Later, this game can be played by two children.
2. The teacher names a picture in her set, asks the child to match the picture and repeat the name. After some practice, the order is reversed and the child selects a picture, names it and asks the teacher to match it. Later, when this game is played by two children, they take turns.

B. Categorizing pictures

1. The same two sets of pictures, described above were used for this game. The teacher asks the child to sort the pictures:
 - a. With all the people in one pile, the animals in the other.
 - b. To match a picture of people in one category, and to match a picture of animals in the other.
 - c. To make two piles of those that "go together."

- d. To ask the child why the pictures on each pile go together, or what is the nature of the category.
2. Large cardboards were used on which circles, squares and triangles were drawn in 3 sizes and 3 colors. Matching cut-outs were made, which could be placed on the cardboard. Teacher and two children play this game with a set of toy telephones. First the children are encouraged to converse on the telephone, as though to a friend, then they are asked to take turns requesting a geometric shape, by shape, size and color, to be matched to the cardboard.
- a. This game was later simplified for the children needing most practice, so that practice could proceed on only one element at a time, that is, either shape, size or color, with combinations added as soon as the children were successful with the simpler matching and description exercise.
- Colors used were blue, red and yellow. Sizes were small, middle-size and large.
- b. This game proved less popular than the picture-matching and naming game but when a hardboard set of shapes was purchased (Judy Equipment Company), with bright, shiny colors, this game became very popular and was further developed.
3. Hardboard geometric shapes, in 3 colors, 3 shapes and 4 sizes. First, the teacher plays this game with two or three children, later she pairs children to play together.
- a. The teacher selects a geometric shape and names it.
- b. The teacher asks children to select shapes and name them.
- c. The teacher asks for shapes by color.

- d. Children ask each other for shapes by color. They name and match shapes.
- e. Finally, the teacher requests shapes by size and color. Children are asked to find all the triangles, to put them in size order (largest to smallest), to sort them by color or by size, etc. When this sorting is easily done, the teacher matches numerals to objects (the numeral 3 to 3 triangles, etc.).

C. Using a weather chart for verbal skill practice

1. A large class calendar chart, for each month, and smaller, matching, individual charts for each child, were used daily, late in the spring, to practice skills of spatial orientation, left-to-right and top-to-bottom direction, identifying names of colors, numerals and naming and describing symbols.

Only the large class calendar chart was used, for about a month, before individual charts were made and distributed daily. The charts were used to record weather symbols. To reduce stimulus complexity, each row or week on the calendar was in a different color, to help children find the right week and day quickly, that is, the numerals and lines representing the first week on the calendar might be red, the second row blue, the third green, the fourth black.

2. Vocabulary practice included teacher questioning of children, individually, in small groups or in one large group, to practice naming color, weather elements or symbols used as:

- a. If you make a sunny day, what colors do you need?
- b. Show me a rainy day on the calendar.
- c. How can you tell which days were rainy days?
- d. Show me where the red numbers are.

- e. What color are the numbers on the first line?
- f. What does this picture of a house mean, in yesterday's space? (Symbol of a holiday - children stay home, do not come to school.)
- g. Look out the window and tell us what kind of weather we have today. (It is cloudy or it is snowing, etc.)

D. Spinning wheel game

A large cardboard wheel was constructed by the teacher, with spokes dividing spaces, some of which were blank, the rest of which showed teacher-drawn pictures of air transport jobs, such as mechanic, porter, pilot, stewardess. The teacher plays a song on the piano, So Early In The Morning. A child is chosen to spin the wheel. If the arrow stops on a picture, the child does a dramatization-dance, after identifying the job. Teacher and children adapt the song to the job functions, naming needed tools and equipment. Teacher adds new vocabulary words, children practice new words in song, dramatizing meanings. Teacher and children named such items as tool kit, flashlight, screw driver, refueling, baggage, hand truck. If child spins and the arrow lands on a blank space, the child can select any topic he likes for his dramatization-dance and song.

Variations on this game were suited to new activities. The same song was used after the children returned from buying vegetables for vegetable soup cooking and the children practiced names of vegetables.

E. Stories with flannel board and flannel cut-out pictures.

The teacher often told the class a story about a recent trip or classroom experience, for which she prepared some appropriate flannel-backed pictures, which she manipulated on the flannel board as she told the story. She then asked each of several children to retell the story in their own words, using the flannel board.

F. Telephone game

These games were played with the teletrainer kit, at first, but were later played with toy telephones. One teacher works with two children who are seated facing each other, just far enough apart so that communication requires words. Each child has the same set of small, wooden, painted figures, chiefly animals and vehicles, but many other categories can be used.

The children are required to take turns asking for items, using standard sentence structure, as, "Will you give me...?" The format requires naming objects, colors, spatial relationships, and sometimes function. When the children know the rules well, two children can play the game without the teacher, if a child who is more advanced verbally is paired with a less advanced child.

G. Naming objects and describing experiences, using slides and movies

This activity sometimes included the whole class, sometimes small groups of 4 or 5 children. As the teacher viewed the pictures with the children, she stimulated vocabulary practice and practice with standard sentence forms by questions as:

1. What do you see?
2. What does the picture show?
3. Do you remember that at the airport? What was happening?
4. What can you tell us about that picture?

APPENDIX D

K-3

Our Story

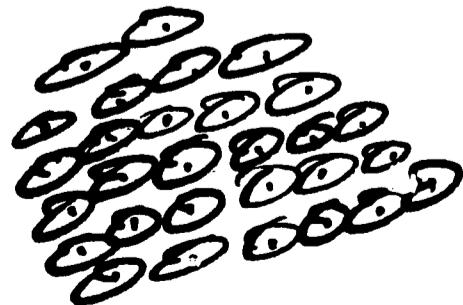
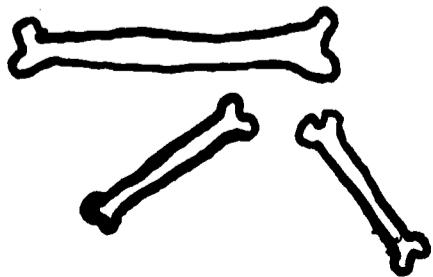
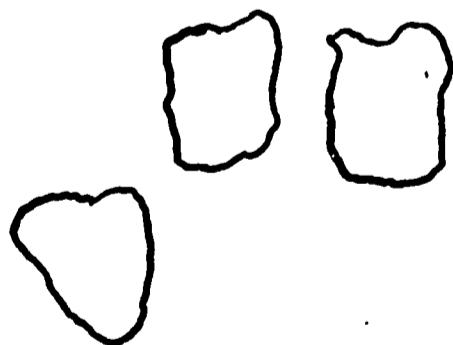
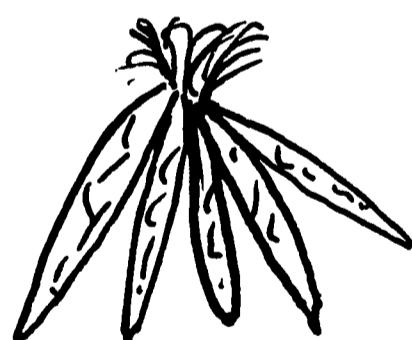
11

Vegetable Soup

We made vegetable soup. Eudualdo said it was the most delicious in my whole life. This is what we did.

We went to the vegetable store to buy vegetables. We bought onions, carrots, potatoes, peas in the pod, green pepper and cabbage. Then we went to the butcher shop and got some soup bones. We also bought some dried beans in the Spanish grocery.

Now we were ready to make our vegetable soup.

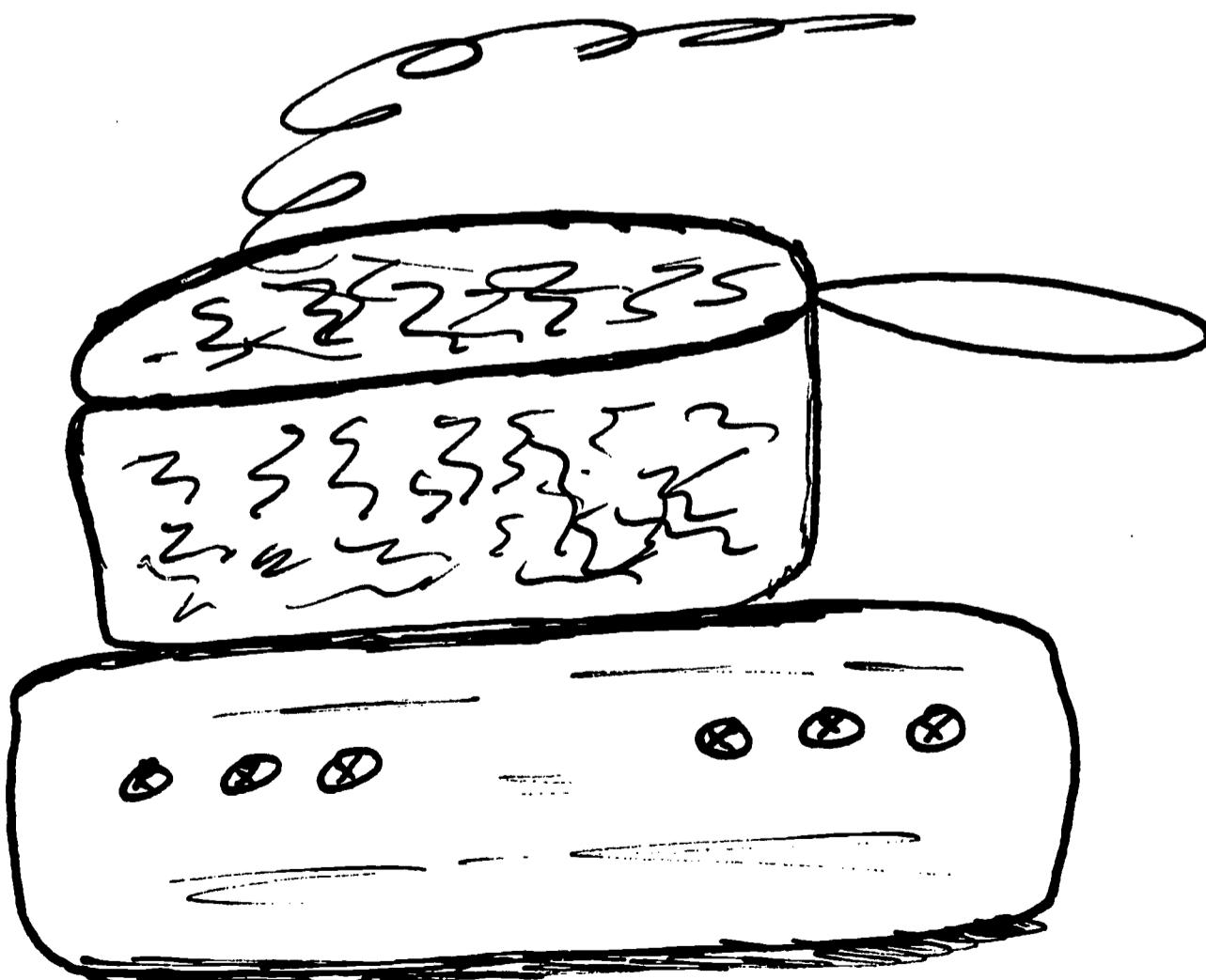


We filled a big pot with water and put it on the stove to boil. Ana cut the carrots, onions, and celery. Rose cut the cabbage with a knife. She put it in the pot. It was hard to cut the carrots and the potatoes.

Michael A. stirred the soup with a spoon, round and round he stirred. Martha said "the carrots are cooking, they are soft".

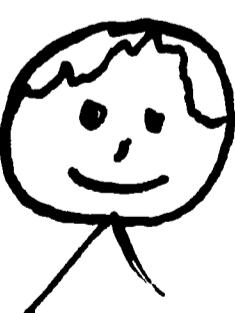
Robert said "smoke is coming out of the pot cause it's hot. Jennifer said "the soup in the pot turned a different color.

Leigh said "I'm cutting up the carrots. The dry beans are in the pot".



When it was done everybody wanted to eat it. Steve said "I'm eating vegetable soup. It's hot". Steve ate a lot. Charlene said "I'm eating the soup", Raymond said "the soup is in paper cups".

Mmmmmmmmmmmmmmmmmmmmm it was delicious. It was the most delicious soup in the whole world.



P. S. 282 Kindergarten Newspaper

January 12, 1965

Room 110 - Miss Jacobson

PUERTO RICAN DAY PARTY

Our class celebrated Puerto Rican Day on November 19. This is the story as told by a group of children.

We cooked plantains (platanos.) First we sliced them. (Domingo) Then we peeled the skin off. (Brenda) They were hard. (Carlene) We cut them up. Then we put oil in the frying pan. (Martha) We fried them in the electric frying pan. We took them out and squashed them and put them back in the frying pan. (Brenda) We put sugar on the platonos. (Jorge) The plantains were sugary. (Raymond) We ate them with the powdered sugar. They tasted sweet. (Steve)

Eudaldo and Jeannette went shopping with Mrs. Robison. They bought majorca bread. At snack time all the children tasted the bread with papaya jelly

(for Spanish translation)

Nuestra clase celebró el Descubrimiento de Puerto Rico el 19 de noviembre. Este es el cuento narrado por los niños.

Cocinamos plátanos. Primero los partimos en pedazos o rebanadas. (Domingo) Luego, los mondamos. (Brenda) Eran duros. (Carlene) Los partimos. Entonces pusimos aceite en el sartén eléctrico. Los sacamos y los exprimimos y los volvimos a echar en el sartén. (Brenda) Le pusimos azúcar a los plátanos. (Jorge) Los plátanos estaban azucarados. (Raymond) Nos los comimos con el azúcar. Eran dulces. (Steve)

Eudaldo y Jeannette fueron a comparar con Mrs. Robison. Compraron pan de mayorca. A la hora de comer, los niños lo probaron con dulce de papaya y plátanos fritos. Fue una

and ate the fried plan-
tain chips. It was a real
party with songs and
dances, too.

Kennedy Airport Trip

Our class had a very
exciting trip to Kennedy
airport on November 25.
We went on a bus. (Henry)
We rode for a long time.
(Martha)

There were a lot of air-
planes--different kinds:
jets and helicopters.
(Michael) We saw the
baggage man. He was
carrying the suitcases.
He put them on the hand
truck. He is called the
porter. (Samuel, Michael)
We went inside the air-
plane. We sat down and
the stewardess buckled
our seat belts. (Robert)

I went in the front
where the pilot is and
where he makes the air-
plane go with all the
buttons and things.

(Brenda) I sat in the
pilot's seat and put
on the pilot's ear-
phones. (Jorge)

We saw the kitchen.
It was small. (Charlene)
That's where they have
food for the passengers.
(Gloria) The stewardess

verdadera fiesta con
canciones y bailes.

Viaje al Aeropuerto
Kennedy

Nuestra clase tuvo un
viaje al aeropuerto
Kennedy el 25 de noviem-
bre. Fuimos en guagua.
(Henry) Caminamos por
largo tiempo en guagua.
(Martha)

Habia muchas clases de
aeroplanos: jets y
helicópteros. (Michael)
Vimos al hombre que
carga el equipaje. Esta-
ba cargando las maletas.
Las puso en un carrito
de manos. Es el cargo-
dor de maletas. (Samuel,
Michael) Fuimos adentro
del avión. Nos sentamos
y las camareras nos
amarraron los cintur-
ones. (Robert)

Yo fui al frente donde
está el piloto y donde
el hace que el avión
camine por medio de
botones y otras cosas.
(Brenda) Yo me senté
en el asiento del
piloto y me puse el
aparato que el piloto
se pone en el oido,
llamado megáfono. (Jorge)

Vimos la cocina del
avión. Era pequeña

gave us chewing gum.
(Paula and others)

Here are some of the people we saw:

Captain (Leigh and others)

Stewardess (everybody)

Pilot (Jennifer, Rose and others)

Ticket clerk (Jeannette)

Porter (Martha, Michael and others)

We heard a lady talking on the microphone. She was telling what time the airplane was taking off, where it was going and the name of the airplane. (Jeannette and others) She talked in English and Spanish so everybody could understand it. (Domingo and Miss Jacobson) We want to go to the airport again. (Everybody)

Thanks to Mothers

Special thanks to Mrs. Roberson (Brenda's mother) and Mrs. Halyard (Charlene's mother) for sewing such fine uniforms: jackets for the captain and pilot and coveralls for the ground crew. We hope other mothers

(Charlene) Ahí es donde tienen alimento para los pasajeros.
(Gloria) Las camareras nos dieron chicles.
(Paula y otras)

He aquí algunas de la gente que vimos:

El Capitan (Leigh y otros)

Las Camareras (todos)

El Piloto (Jennifer, Rose y otros)

El empleado que vende los boletos o tickets (Jeannette)

El cargador de maletas (Martha, Michael y otros)

Oímos a una dama hablando por los micrófonos. Estaba hablando a que hora el avión salía, a donde iba y el nombre del avión.
(Jeannette y otros)

Ella hablaba en inglés y español para que todo el mundo entendiera. (Domingo y Miss Jacobson) Queremos ir al aeropuerto otra vez. (Todos)

Gracias a las Madres

Gracias a Mrs. Roberson (la mamá de Brenda)

will help us with sewing more uniforms. Miss Jacobson has the material and patterns.

Our Lending Library

Some parents have been reading the story books brought home from our kindergarten to their children. Everybody enjoyed hearing these children "read" the stories to the class afterwards. More children will be able to take books home from our kindergarten library after the holidays.

Please read this newspaper to your child and talk about the news with him.

y a Mrs. Halyard (la mamá de Charlene's) por cocer tan bonitos uniformes: abrigos para el capitán y el piloto y otros miembros de la tripulación.

Esperamos que otras madres nos ayuden a cocer más uniformes. Miss Jacobson tiene el material y los patrones.

De Nuestra Biblioteca

Que Presta Libros

Algunos padres han estado leyendo los libros de cuentos que han traído a la casa los niños de Kindergarten. Los leen con sus hijos. Todo el mundo gozó oyendo a estos niños leerles los cuentos a la clase después. Mas ninos podrán llevar libros a la casa de la biblioteca de Kindergarten después de los días de fiesta.

Por favor, lea este periodiquito con su niño y discútalo con él. Hable con él de lo que dice.